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No. 22.—1905

DEPARTMENT OF THE INTERIOR
BUREAU OF GOVERNMENT LABORATORIES

I. DESCRIPTION OF NEW BUILDINGS

BY PAUL C. FREER, M. D., PH. D.

II. A CATALOGUE OF THE LIBRARY

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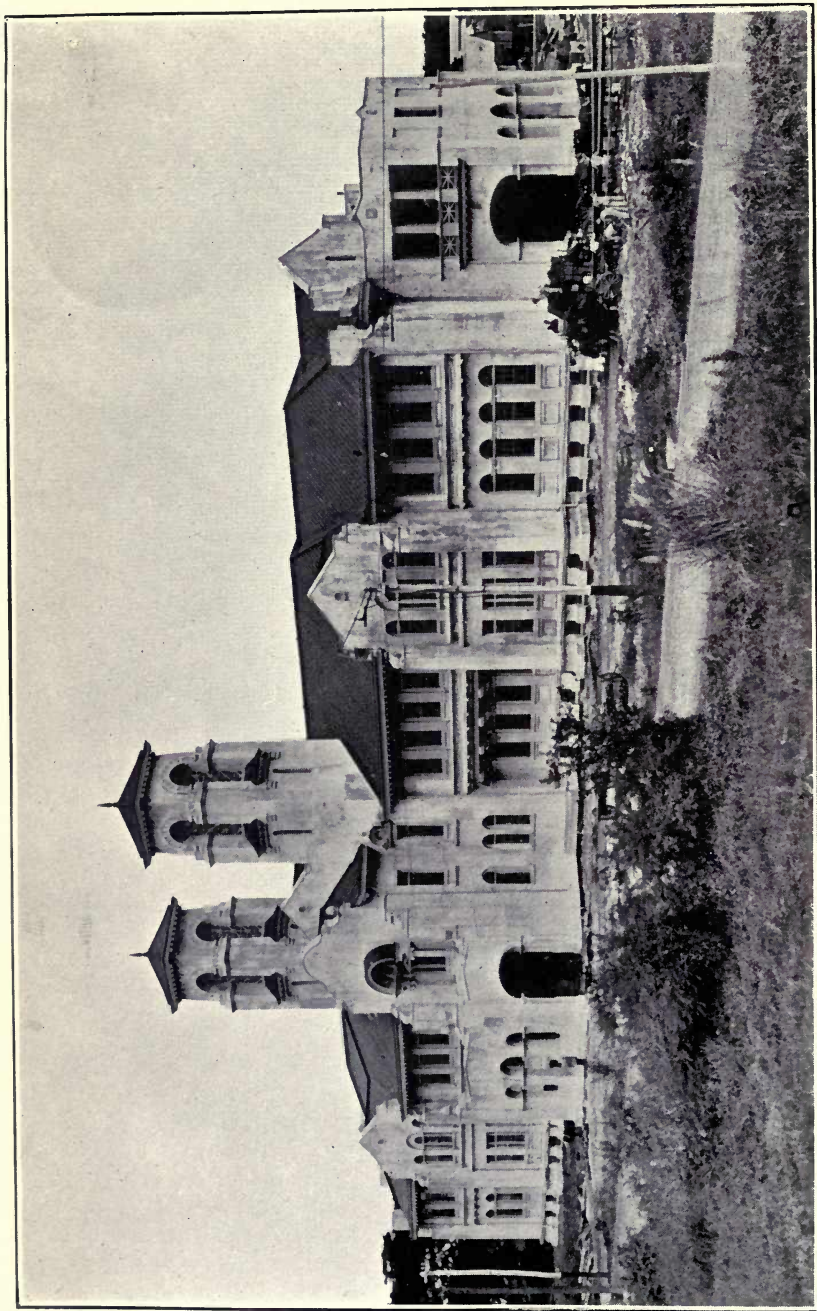
MANILA
BUREAU OF PUBLIC PRINTING
1905

PREVIOUS PUBLICATIONS OF THE BUREAU OF GOVERNMENT LABORATORIES.

- No. 1, 1902, *Biological Laboratory*.—Preliminary Report of the Appearance in the Philippine Islands of a Disease Clinically Resembling Glanders. By R. P. Strong, M. D.
- No. 2, 1902, *Chemical Laboratory*.—The Preparation of Benzoyl-Acetyl Peroxide, and Its Use as an Intestinal Antiseptic in Cholera and Dysentery. By Paul C. Freer, M. D., Ph. D.
- No. 3, 1903, *Biological Laboratory*.—A Preliminary Report on Trypanosomiasis of Horses in the Philippine Islands. By W. E. Musgrave, M. D., and Norman E. Williamson.
- No. 4, 1903, *Serum Laboratory*.—Preliminary Report on the Study of Rinderpest of Cattle and Carabaos in the Philippine Islands. By James W. Jobling, M. D.
- No. 5, 1903, *Biological Laboratory*.—Trypanosoma and Trypanosomiasis, with Special Reference to Surra in the Philippine Islands. By W. E. Musgrave, M. D., and Moses T. Clegg.
- No. 6, 1903.—I. New or Noteworthy Philippine Plants. II. The American Element in the Philippine Flora. By Elmer D. Merrill, Botanist.
- No. 7, 1903, *Chemical Laboratory*.—The Gutta Percha and Rubber of the Philippine Islands. By Penoyer L. Sherman, jr., Ph. D.
- No. 8, 1903.—A Dictionary of the Plant Names of the Philippine Islands. By Elmer D. Merrill, Botanist.
- No. 9, 1903, *Biological Laboratory*.—A Report on Hemorrhagic Septicæmia in Animals in the Philippine Islands. By Paul G. Woolley, M. D., and James W. Jobling, M. D.
- No. 10, 1903, *Biological Laboratory*.—A Report on Two Cases of a Peculiar Form of Hand Infection Due to an Organism Resembling the Koch-Weeks Bacillus. By John R. McDill, M. D., and Wm. B. Wherry, M. D.
- No. 11, 1903, *Biological Laboratory, Entomological Division*.—Bulletin No. 1, Preliminary Bulletin on Insects of the Cacao. (Prepared especially for the benefit of farmers.) By Chas. S. Banks, Entomologist.
- No. 12, 1903, *Biological Laboratory*.—Report on Some Pulmonary Lesions Produced by the Bacillus of Hemorrhagic Septicæmia of Carabaos. By Paul G. Woolley, M. D.
- No. 13, 1904, *Biological Laboratory*.—Fatal Infection by a Hitherto Undescribed Chromogenic Bacterium: *Bacillus Aureus Fœtidus*. By Maximilian Herzog, M. D.
- No. 14, 1904.—*Serum Laboratory*: Texas Fever in the Philippine Islands and the Far East. By James W. Jobling, M. D., and Paul G. Woolley, M. D. *Biological Laboratory*: The Australian Tick (*Boophilus australis* Fuller) in the Philippine Islands. By Charles S. Banks, Entomologist.
- No. 15, 1904, *Biological and Serum Laboratories*.—Report on *Bacillus Violaceus Manilæ*, a Pathogenic Micro-organism. By Paul G. Woolley, M. D.
- No. 16, 1904, *Biological Laboratory*.—Protective Inoculation against Asiatic Cholera: An Experimental Study. By Richard P. Strong, M. D.
- No. 17, 1904.—New or Noteworthy Philippine Plants. By Elmer D. Merrill, Botanist.
- No. 18, 1904, *Biological Laboratory*.—I. Amebas: Their Cultivation and Etiologic Significance. By W. E. Musgrave, M. D., and Moses T. Clegg. II. The Treatment of Uncomplicated Intestinal Amebiasis (Amebic Dysentery) in the Tropics. By W. E. Musgrave, M. D.
- No. 19, 1904, *Biological Laboratory*.—Some Observations on the Biology of the Cholera Spirillum. By Wm. B. Wherry, M. D.

(Continued on third page of cover.)





VIEW OF THE FRONT ELEVATION OF THE BUILDING. (FRONTISPIECE.)

No. 22.—1905

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LETTER OF TRANSMITTAL.

DEPARTMENT OF THE INTERIOR,
BUREAU OF GOVERNMENT LABORATORIES,
OFFICE OF THE SUPERINTENDENT OF LABORATORIES,

Manila, October 20, 1904.

SIR: I have the honor to transmit herewith a paper entitled "I. Description of the New Buildings of the Bureau of Government Laboratories," by Paul C. Freer, M. D., Ph. D., Superintendent of Government Laboratories, and "II. A Catalogue of the Library of the Bureau of Government Laboratories," by Mary Polk, librarian.

I am, very respectfully,

PAUL C. FREER,
Superintendent of Government Laboratories.

Hon. DEAN C. WORCESTER,
Secretary of the Interior, Manila, P. I.

I. DESCRIPTION OF THE NEW BUILDINGS OF
THE BUREAU OF GOVERNMENT
LABORATORIES.

PART I.

THE ORGANIZATION AND THE BUILDINGS OF THE BUREAU OF GOVERNMENT LABORATORIES.

INTRODUCTION.

Tropical countries which are subject to colonization by the white races present conditions which are such that the settlers are continually exposed to infectious diseases, differing from those prevalent in colder regions, and, owing to the fact that the European races in these countries have been moved from their native soil they are exposed to greater dangers than the native population, which have become accustomed to the surroundings. However, it is true that the natives contract the same class of diseases and are subject, though perhaps in a lesser degree, to the same dangers. Tropical localities are especially prone to the occurrence of serious epidemics both of man and of animals. In all such countries the native population regard the causes of the sicknesses which afflict them from a standpoint entirely different from that of the educated white man. Superstition and imperfect education leads them to disbelieve in measures which the modern scientific world has recognized as necessary. For this reason, health boards, modeled more or less after those of the mother countries but modified as to their powers and duties in order to meet existing conditions, have been deemed essential in all tropical colonies, but their work to a very great extent would be imperfect, haphazard, and unsuccessful if the methods of prophylaxis were not guided and sustained by a scientific knowledge of the causation of disease and by accurate diagnoses of the exact nature of the infections which are encountered. From a material standpoint, the damage to commerce caused by epidemics of cholera, plague, rinderpest, and surra is such that the loss where these diseases gain a foothold by far outweighs the cost

of any measures of prevention, however expensive. For the purpose of diagnosis and for the further study of methods of prophylaxis and cure, a biological laboratory, properly equipped, is an essential. The work is of so difficult a nature, so important, and, if imperfect methods are used, so subject to error, that a poor equipment both in the literature of medical biology and in apparatus would be the precursor of failure. The appliances must be of the best, the literature on all branches of the work must be at hand, and the bacteriologists performing the diagnoses must have a thorough and complete training. However, bacteriological laboratories in the Tropics must not confine themselves to subjects of diagnosis—they must also be expected to make advances by research on special subjects of importance, and they must continually enlarge their field by the observation of interesting or new diseases which may come to their attention, because it can never be predicted that an apparently harmless malady which is imperfectly known may not eventually assume serious proportions. In so doing the laboratories can guard the public by timely warnings. Each tropical colony presents different conditions, different phases of the same disease, and even new and unknown infections. The prevention of the spread of any disease must presuppose a perfect knowledge of its etiology and of the other factors which enter into its prevention and treatment, and such knowledge can only be gained by an investigation of the subject based upon a study of the literature and supplemented by new investigations in the laboratory. Research in the field outlined above demands the highest type of trained investigators, a complete library, and exceptional facilities. The value of this class of work is so universally recognized that governments in the past have organized expensive expeditions to tropical countries for the purpose of increasing the world's knowledge of the diseases peculiar to those regions. However, such expeditions can not possibly carry with them all the materials for their work without encountering great difficulties which rob them both of time and opportunity, and their results would be far more beneficial if they could come to permanent stations.

For a properly equipped biological laboratory there are necessary not only adequate rooms, well lighted without direct sunlight, but also apparatus such as microscopes, incubators, sterilizers, microtomes, surgical instruments, glassware of all kinds, stains, chemicals, and small animals. The latter, such as guinea pigs,

rabbits, monkeys, goats, and dogs, are as much a portion of the laboratory reagents as are the culture media in which the bacteria grow or the microscopes through which they are seen.

Tropical colonies are also of necessity regions the prosperity of which depends upon agriculture, upon an exploitation of the natural products, upon mining interests, and the means for the barter and sale of raw products. They can not under present conditions, or presumably even in the remote future, become manufacturing centers excepting for products closely related to their chief staples. It is a fact that the interior of many of these countries is but little known, that the products are gathered by persons ignorant of their true uses and values, that in many cases they are allowed to go to waste for want of a proper knowledge, and that in others the exploitation is desultory and imperfect. Some phases of tropical agriculture are fairly well advanced; among these may be mentioned the culture of the cocoanut, of hemp, rice, etc., but when it comes to articles of a different character, which are obtained from the forests or mines, it is found that much uncertainty exists. Gums and resins, which are supposed to be of but little value to the natives and which they may use for fuel or for lighting purposes, may, on distillation, produce substances of far higher commercial value. Medicinal plants may exist in large numbers with qualities unknown or imperfectly known to the people, but containing alkaloids and other materials which if properly investigated would be readily marketable at high prices. New fields of enterprise, based upon knowledge secured in other countries, may also be introduced. In order to gain advantages not heretofore obtained in the conservation and exploitation of natural products or of those introduced for the purposes of culture, bureaus of forestry, agriculture, and mines and commercial museums have been established, but all of these need the assistance, advice, and research work of laboratories to answer questions as to the nature of soils and minerals, the value of ores, the uses and composition of oils, gums, resins, and medicinal plants, and without such assistance the value of their work would be but a fraction of what it is.

For the purposes of study of the subjects mentioned above a necessity exists for a laboratory of chemistry and for facilities to pursue and complete accurate researches on the materials which can be obtained. In the Tropics, as well as in other countries, the

question of the character of the foods and drinks, the analysis of imported products which too frequently are adulterated, the determination of values for custom duties, the testing of the strength of cements, the assaying of ores, and the performance of other analytical work are necessary, and, as these regions are not supplied with universities, analytical laboratories must be provided in charge of the various governments.

As the people depend upon products of the field and of the forests for so large a proportion of their sustenance and barter, a knowledge of the flora of the Tropics is essential, from both a scientific and a material standpoint. It is necessary to be able to identify plants which have once been encountered in order to understand something of their distribution and general importance, to study their growth, the conditions necessary for their best development, and their diseases. Bureaus of forestry and agriculture must depend upon botanical work to assist them in their duties. The chemist, in investigating plant products, needs an identification of the plants from which the latter come. For these reasons botanical work becomes as essential as that in any other laboratory field.

Tropical countries are, *par excellence*, those in which insect pests are most frequent and widely distributed, so that the means for the study of entomology, facilities for classifying the material gathered, and for ascertaining the nature of the insects most dangerous to valuable flora should be at hand, and this need must be met by the employment of entomologists and by providing space for their work.

Modern methods for the treatment of disease have become more and more dependent upon serum therapy. The results obtained with rinderpest in South Africa and in India, with plague prophylactic in Japan, with cholera prophylactic in India and Japan, and the necessity for vaccination against smallpox, at once suggest the establishment of serum laboratories in tropical countries. Because serums are perishable they can not very successfully be shipped through long distances, and many of the tropical diseases which yield either to serum prophylaxis or therapy are of such a nature that the serums themselves can not be prepared except on the spot.

Other branches of laboratory work readily suggest themselves as being equally essential to the proper development of colonial enterprise. One of these would be a study of the fauna of the regions in question, both marine and terrestrial. A laboratory for zoölogy

and marine biology would be entitled to equal rank with the others mentioned above.

A government in beginning its work can adopt one of two lines of action. It may either allow its various divisions which come in contact with and which need scientific aid themselves to establish the various laboratories in question, each under separate direction and each with separate facilities, or it may adopt the course of inaugurating one central institution where all this class of work can be united, where, therefore, the workers can be in close contact, and where each division is well aware of what is being done in the others. Coöperation in this sense would be most complete, and while there might be some slight disadvantages in the latter course by reason of the fact that the various divisions of the government could not in their own quarters study and obtain the results looked for, these are by far outweighed by the coöperation which can be obtained between the scientific men by the division of labor, which frequently saves both time and money, and by the reduction in equipment, which inevitably follows a concentration of allied interests.

The Civil Government of the Philippine Islands, taking all of the above-mentioned facts into consideration, and knowing well the expense and loss of efficiency due to a scattering of its scientific energies through a number of bureaus, decided to establish one central laboratory system, to properly equip and house this series of institutions, and to place them under a central direction.

By Act No. 156 of the Philippine Commission, passed in July, 1901, there was established a Bureau of Government Laboratories, consisting of a biological laboratory and a chemical laboratory. Later, by Act No. 607, there was united therewith a serum laboratory. Subsequently the botanist of the Agricultural Bureau was transferred to the Bureau of Government Laboratories and the botanical staff was enlarged, so that another division was added to the biological laboratory. Entomological investigation was also begun, and of late zoölogical work has been undertaken.

By Act No. 156 the Superintendent of Government Laboratories was directed to prepare plans for a suitable building for the installation of the biological laboratory, the chemical laboratory, and a reference library; for a laboratory for the manufacture of vaccine virus, serums, and prophylactics; detailed estimates of the cost of

the buildings and of properly equipping the different laboratories, and of procuring a reference library. Pursuant to these directions the Superintendent of Government Laboratories, soon after his arrival in the Philippine Islands in September, 1901, with the assistance of the Chief of the Insular Bureau of Architecture, Mr. E. K. Bourne, and the Director of the Biological Laboratory, began the preparation of the plans.

Discussion of the proper type of building to be used for laboratory purposes of various kinds, the question as to whether large general rooms or small individual ones are more advantageous, the consideration of the necessities for modern laboratory work, and the other general phases of the struggle for perfection in laboratory construction has of late occupied a considerable field in the deliberations of scientific bodies, and it may be said that there are as many views as to what is necessary and as to what means should be employed to reach given ends in laboratory work as there are laboratory workers. The day has gone by when scientific research can be successfully conducted on the kitchen stove. Those things which could be done with simple appliances and with simple or imperfect equipment have been done. Modern scientific theories and the facts upon which they are based are the product of investigation which uses every possible means to obtain the end sought, and are based upon exact and accurate measurements. To accomplish such ends at the present time requires an equipment far beyond that ever dreamed of, or possible, fifty years ago, and it is because of this rapid development that the discussion of laboratory construction has become an important one. As the new Government Laboratories in Manila were to signalize a departure in the policy of tropical governments, by uniting all laboratory work in one bureau, and, as the buildings of necessity were designed to meet many ends, it has been deemed not superfluous to describe the structures as finally erected and to bring before the scientific world such phases as may be new and interesting.

The question as to whether the laboratory buildings should contain large general rooms or should be composed of smaller apartments for scientific work was decided in favor of the latter method of construction, for the following reasons: The Bureau is not expected to handle large classes of students and consequently lecture rooms could be omitted; and the variety of its work is such

that in any event a considerable separation of the men would be necessary. At most no more than four workers in the same line would presumably need space at the same time, and as all laboratories would be in one building, the freedom of contact and opportunity for discussion would not materially be curtailed, although each class of work could be completely separated from all others. These arguments were so strongly in favor of smaller and numerous rooms that the main structure was planned accordingly. The decision to place all the laboratories in one building was made in order to secure compactness, ease of administration, and to foster in the highest degree the personal contact of the scientific workers in the laboratory. While there may be some argument in favor of separating biological and chemical laboratories, nevertheless, by properly planning the building the work can be divided in different wings, and by supplying adequate hoods and drafts it is certain that all classes of work can be placed under one roof without the one interfering with the other.

As the building was to be in the Tropics, it was necessary to pay great attention to ventilation and coolness, so that in the main structure the rooms were grouped on either side of a large main corridor 10 feet wide and running the entire length of the building. As this hallway is open at either end, a breeze is almost continually passing through it, generally supplying a suction as it passes the doors of the individual laboratories so that a constant circulation of air is produced. The building was designed to be of no more than two stories, both because of the fact that the Philippine Islands are subject to earthquakes and also because previous experience has demonstrated that unless great care is taken the laboratories on the top floor, if leakage or breakage of containers of liquids should occur, are apt to interfere with the work below. This danger is minimized in a two-story structure.

When the work of preparing the plans was first undertaken it was decided to be expedient and necessary to install a power plant of a capacity to provide all of the rooms with vacuum, air pressure, and steam, and as up to the present time the alternating current furnished by the Manila electric-light works has been unsatisfactory for laboratory purposes, it was also planned to give sufficient power to light all the laboratory buildings. While the discussion was being carried on in regard to the amount of power necessary,

it was decided to add two wings to the building in the future, one to accommodate the Bureaus of Forestry and Public Lands, the other those of Agriculture and Mining, so that an enlargement of the power plant in order to meet the increased demand was called for. Finally, in considering a site for a hospital in Manila, it was decided that the Bureau of Government Laboratories, by its very nature, should be located in proximity to the institution which it was proposed to establish, not only because laboratory work is an essential to success in modern hospitals, but also because of the economy which would be brought about by having a central light and power plant for all of the structures which were to be grouped together. This plan necessitated a further increase in the machinery and equipment.

The location of the building was for a long time uncertain. The intention at first was to place the laboratories on the high land at Santa Mesa to the north and east of the city of Manila, a situation which was ideal in every respect excepting that of distance. At Santa Mesa there were abundant lands, but unfortunately the title thereof was involved, and for this reason, unless the Government wished to wait a long time for its adjustment, the site was unavailable. In consequence, the old Exposition Grounds, between Calle Herran and Calle Padre Faura, of an area of approximately 24 acres, were decided upon. This land is much nearer the heart of the city than is the other location; it is level, although somewhat low, and its situation is such that were a hospital to be placed on it the length of the trips for the ambulances and for the patients would be minimized. The tract of land is also of sufficient size to accommodate not only the laboratory buildings and all future wings but also a proposed medical college and the necessary hospital structures. The location having been decided upon and a small additional tract of land, which was necessary in order to round out the Exposition Grounds into a regular piece, having been purchased, it became possible to begin the structure at once. Previous to this time the plans had been carefully prepared, including not only those of the building and power house but also those of the necessary laboratory desks, hoods, and appliances of all kinds. They had been presented to the Philippine Commission, approved by them and the Civil Governor, and work on the foundation was begun in October, 1902.

PLAN OF THE BUILDINGS.

The buildings were divided into a main laboratory structure, facing toward the south and divided into two symmetrical portions, the one on the east for the biological and the one on the west for the chemical laboratory.¹ The power house was placed to the rear and connected with the main structure by means of a corridor, and in addition to the space for the boilers and engines it provides room for the serum laboratory.²

The whole structure, therefore, is in the form of the letter T, that portion of it in which biological and chemical work is carried on being so planned as to give the minimum of direct sunlight—a great desideratum for microscopic work. Bisecting the main structure lengthwise are three corridors 10 feet wide and 236 feet long, the one in the foundation being for the purpose of giving access to all the pipes leading from the power house and to provide space for the storage battery. The two upper hallways are the main passageways of the building and all of the rooms open on them. The eastern half of the structure is devoted to biological work with the exception of the space occupied by one room (No. 10) for storage of apparatus and another for offices (No. 13). Passing through the main entrance and turning to the right, the disposition of the rooms is as follows: No. 12 for the preparation of culture media for biological work, No. 14 for botanical work, No. 18 as a storehouse for botanical duplicates, No. 19 a mechanic's room, Nos. 17 and 15 for bacteriologic diagnosis and research. On the upper floor in the same order No. 116 is for the photographer, No. 118 for the pathological museum, No. 120 for pathological work and research, No. 122 for incubators and refrigerators, No. 124 for entomological work, No. 121 an outdoor laboratory for the entomologists, No. 119 a laboratory room for bacteriological and pathological research, No. 117 for biological research, and No. 115 as an office for the Director of the Biological Laboratory. Turning to the left from the entranceway on the ground floor, room No. 8 is for the storage of chemicals and apparatus; No. 6 as a laboratory for organic chemistry in connection with drugs, medicinal plants, and natural products; No. 4 for a commercial laboratory in chem-

¹ See Pls. I and II.² See Pl. IX.

istry, with the machinery for carrying on commercial processes on a laboratory scale; No. 1 for photometric work; No. 3 for physical chemistry and physics; No. 5 for the same purposes and for the adjustment of weights and measures; No. 7 for assaying and mineral work; No. 9 for a balance room, and No. 11 for organic combustion. On the second floor and in the same order No. 114 is the balance room for the upper floor; No. 112 for the use of the ornithologist; No. 110 is a chemical laboratory fitted for work with soils, water, and organic chemistry; No. 108 a chemical laboratory fitted for all classes of work; No. 106 for spectroscopes and instruments of precision; No. 104 for sugar, foods, and physiological chemistry; No. 103 for mineral analysis; No. 105 for general chemical work of all classes, and No. 107 as an office for the Superintendent of Government Laboratories. The three central rooms to the front—Nos. 109, 111, and 113—are for the purposes of the library, Nos. 109 and 113 being stack rooms and No. 111 the reading room, stack room, librarian's office, and general library. Passing to the rear on the ground floor and turning to the left in the power house, Nos. 50 and 51 are for cold storage, No. 52 for the packing and shipping of vaccine and serums, No. 53 for the preparation of sérums, No. 54 as a room for the preparation of culture media for the serum laboratory, No. 55 as a boiler room, No. 56 for the gas-plant generators, No. 57 for coal, No. 58 for a crematory, No. 59 for the engine room, and No. 60 for cold-storage machinery. No. 153 is the office of the Director of the Serum Laboratory and Nos. 150 and 152 are laboratories for bacteriological and pathological work of the serum laboratory. To the rear of the entire structure are placed the animal houses, including buildings for the storing of guinea pigs and rabbits, with a wing for work on bubonic plague and contagious diseases; a stable for the serum horses, one for the vaccine calves, and one for the storing of monkeys, dogs, and goats.¹ The list given above completes a statement of the purposes for which the rooms were originally intended, but the detailed description which will be given below makes it evident that the building is really so constructed as to give it great elasticity in the class of work which can be conducted therein and in providing for a large increase in the number of workers.

¹ See Pls. III-VI.

POWER EQUIPMENT.

The boiler-room equipment consists of two 75-horsepower Babcock & Wilcox steel sectional boilers set in one battery and designed for a working pressure of 150 pounds per square inch. Steam is led from the boilers through 4-inch copper-expansion bends to an 8-inch extra-heavy steel-pipe header, from which a 7-inch steam main drops to the pipe subway. The engine supplies are 3-inch copper pipes tapped into the 7-inch main and carried into the engine room below the floor line, from where they are carried up to the cylinders by expansion bends of 4-foot 4-inch radius. The exhaust main is 8-inch standard pipe, and passes through a 200-horsepower Wainwright even-flow feed-water heater, which is placed in the subway, and from the latter it passes through the boiler room to the atmosphere, being fitted with a 24 by 30 inch bent exhaust head. The main steam and exhaust lines are drained by two Bundy return-steam traps discharging into a feed-suction tank located in the subway.

The flue gases from the boiler are led through a sheet-steel smoke header to the main smokestack, which is of 48-inch internal diameter and 103 feet high. A damper is fitted into the smoke header which is automatically controlled by a Locke hydraulic damper regulator. A 24 by 60 inch vertical auxiliary boiler, with a Deane 3¼ by 4 inch duplex steam pump, is installed for general water service during periods when the main boilers are shut down. The feed water for the main boilers passes through a Loomis-Manning Type H pressure filter, which discharges into a filter tank having a capacity of 500 gallons, from which it is carried to two 11½-inch Metropolitan double-tube injectors fitted to the main boilers, the auxiliary boiler and pump, and to the main feed pump, which is of the Deane triplex single-acting type, with cylinders 4 by 4 inches geared to a Stow multispeed motor. The pump and motor are located in the pipe subway, and receive water from the steam traps and cylinder jackets of the air compressor, vacuum pump, and ice machine, as well as from the filter tanks.

The fire pump is of the Deane duplex inside-plunger pattern, 7½ by 4½ by 10 inches, with 4-inch suction and 3-inch discharge to the fire-main system in the main building. A connection is also made from this pump to the house-service tanks, two in number,

having a combined capacity of 900 gallons, located on the south side of the boiler room. The tanks are so connected that they may be used either together or singly. Coal-storage capacity of 30 tons is provided on the north side of the boiler room.

Two Mansfield oil gas generators of a capacity of 100 cubic feet per hour each are installed close to the coal bunkers and deliver gas to two sheet-steel gas holders, each of 1,250 cubic feet capacity, located 100 feet from the power-house building. A 12-inch smoke header connects the gas-generator furnaces to the main stack.

A cremating furnace 10 by 5 by 6 feet is built at the foot of the main stack, having 12 square feet of grate surface and an incinerating chamber of 4 by $2\frac{1}{2}$ by $2\frac{1}{2}$ feet for burning laboratory refuse, small animals, etc.

All piping, conduits, etc., connecting the various apparatus in the boiler room pass through a concrete trench covered by checkered-steel floor plates to the pipe subway, from which point they are carried to the basement corridor in the main building. The piping ranges in size from one-fourth inch to 8 inches, and wire conduits from one-half inch to $2\frac{1}{2}$ inches. The subway and corridor are automatically drained by Lawlor cellar ejectors worked by water pressure.

The west end of the main basement corridor contains a storage battery of 20 cells from which current is conveyed to various laboratory rooms.¹

The engine-room equipment consists of two horizontal single-expansion Ideal automatic engines of 60 horsepower each, direct connected to two Westinghouse $37\frac{1}{2}$ -kilowatt six-pole compound-wound direct-current generators. Each unit has a capacity of 300 amperes at an electromotive force of 125 volts at a speed range of 290 to 320 revolutions per minute. The generators are fitted with equalized connections for parallel working. Current is led from the generators through loricated-steel conduits laid below the flooring to a 5-panel black slate switchboard 15 feet long. Each generator is protected by an I-T-E laminated contact circuit breaker. The switchboard has two-generator one-power distributing and one light-distributing panel, and one panel for instruments; it also carries all the air, gas, vacuum, water, steam, and electrical indicating and recording gauges. Ten light-and-power feeders are

¹ Pls. X and XI are photographs of the boiler rooms.



carried from the distributing panels by means of 2-inch loricated-steel conduits through the subways to eight distributing panels located in the corridors of the main building, and two power feeders pass through conduit to the towers to supply the exhaust-ventilator motors.

Compressed air is supplied by a No. 21 "Christensen" Type N $8\frac{1}{2}$ by 8 inch horizontal compressor of 75 cubic feet per minute capacity. The compressor is direct geared to a 14-horsepower series-wound four-pole motor, and is automatically controlled between any predetermined maximum and minimum pressure. The air receiver is 3 feet in diameter by 10 feet high and is located in the boiler room.

The vacuum pump is a 7 by 7 inch "Clayton" type, and is geared to a General Electric CE type direct-current 3-horsepower motor and will maintain a vacuum in the pipe system of the main building of approximately 29 inches.

The house-service pump is a No. 4 "Quimby" type, direct connected to a General Electric CE type 15-horsepower motor, automatically controlled between any predetermined maximum and minimum pressures up to 125 pounds per square inch. The pump has a 4-inch suction and a 3-inch discharge to two 36 by 120 inch compression tanks located in the boiler room, from which the water is distributed to the main building and animal houses.

The refrigerating machinery consists of a "Brunswick" double-cylinder single-acting ammonia compressor of 3 tons refrigerating capacity, direct connected to a General Electric eight-pole slow-speed motor, a double-pipe ammonia condenser, oil separator, ammonia receiver, with combination gauges, thermometers, etc., located in the south end of the engine room. The brine tank is 4 by 6 by 14 feet and contains five 1-inch ammonia expansion coils; the chilled brine is circulated by a "Quimby" No. $2\frac{1}{2}$ rotary brine pump, direct connected to a General Electric CE type 1-horsepower motor, and passes to two cold-storage rooms having a joint capacity of 3,000 cubic feet and to two refrigerating boxes in the main building each having a capacity of 200 cubic feet. Each of the main storage rooms has five refrigerating coils of $1\frac{1}{4}$ -inch galvanized pipe and will be maintained at a temperature of 28° F.

Two 15-inch "Buffalo" B volume No. 6 exhaust fans, direct connected to General Electric CE type 5-horsepower motors, are located in the towers of the main building and connect with a

16-inch exhaust main in the attic, from which 4 and 6 inch branches are carried down to the hoods on the first and second floors. The motors are operated from the main switchboard by means of solenoid-controlled switches and self-starting rheostats.

The exhausters will maintain a velocity of 1,800 feet per minute through the mains and will allow a complete change of air every minute in all the hoods.¹

Starting from the power house all the main distribution of the building is through a subway which is in the form of the letter T, the portion entering from the power house joining that from the main building at about the middle. The diameters of the piping leading to the various laboratory rooms have been calculated so as to give as equal a supply as possible of gas, water, vacuum, air pressure, and steam in the various rooms. In order to effect this, the water and gas mains form loops on each floor of the two wings of the main building, thus supplying a perfectly even circulation, and the taps to the individual rooms and desks are taken from these loops. The electric-light wires as well as those of the storage battery and telephones are carried throughout in steel conduit and distributed wherever needed, so that each desk is supplied with light and electric power, provided the motors to be used do not exceed one-sixteenth horsepower. Where greater power than this is necessary, separate lines have been run into the building. The storage-battery current is supplied only to those rooms where presumably it will be necessary; for example, those for mineral analysis, physics, and weights and measures, the spectrum analysis room, and the private laboratory of the Superintendent of Government Laboratories.

THE DESK ARRANGEMENTS IN THE INDIVIDUAL ROOMS.

The general plan and assignment of the rooms has been mentioned above, so that only a description of the individual arrangements is necessary. As these vary but little throughout the biological and chemical wings, a description of one room for each section will, with few exceptions, do for the others. In the biological wing a microscope table 32 inches above the floor and 30 inches wide is provided along the entire available window front.

¹ Pl. XII is a photograph of the engine rooms.

Each one of these contains two small sinks let in at convenient points, and is furnished with water and gas. Those portions of the tables directly facing the windows are not supplied with drawers, the latter being provided in those sections which presumably, by reason of their not being directly centered behind windows, would not be used for microscopic work. The windows have been placed approximately 16 inches above the level of the desks, so that the strong breezes which prevail in this country would not play havoc with the materials on the work table, but at the same time the light is ample. In the center of each room devoted to biology is a large double work desk supplied with gas, water, and vacuum, with a large sink and drip board at one end. These desks are 36 inches high and are intended for the general work of the laboratory, providing facilities for heating, filtering, distilling, etc. Each one of these central tables has closets underneath and drawers. To one side, along the wall of each biological room, is a chemical work table furnished with gas, water, and vacuum connected with a sink and having a trough extending the length of the desk; the opposite wall is occupied by a hood 8 feet in length, equipped like the side desk, which will supply facilities for work with such materials as should be excluded from the general laboratory air. Each hood has a separate flue extending up into the attic and connecting with the main trunks in the exhaust, so that ample draft will be provided. The hoods are supplied with gas, water, vacuum, and sinks.

An exception to the general arrangements outlined above is found in the room on the ground floor devoted to the preparation of culture media. In this there is provided steam for use in connection with the autoclaves and sterilizers, as well as gas, water, and vacuum. The main autoclaves of the building, for the use of the biological laboratory, are placed in this room in which all of the culture media is prepared. It has the usual window desk and hood, but in place of the central work desk there is provided a heavy, square table intended to serve in preparing the various media.

The rooms for the botanists are not provided with the side tables and hoods. In their place the glass-front herbarium cases are mounted one above the other.

On each floor of the biological wing there is a room 10 feet wide and 24 feet long for the purpose of accommodating the refrigerating boxes and the incubators. The former are cooled by coils provided

from the cold-storage equipment and are built in two sections, so that one portion may be kept at any temperature within the capacity of the plant, whereas the other may be regulated at 20° to 25°. The incubators are in the form of large boxes with a central door and shelves around the sides; they are 7 feet long and 3 feet wide, and are heated by Bunsen burners. Electric heat for the incubators is planned to be installed in the future, but it can not be operated successfully until after the hospital buildings are constructed, because it is not intended to run the power plant day and night until the necessity arises. The incubator rooms also have in them, attached to the walls, the smaller thermostats for heating paraffin for sectioning and smaller incubators for varying temperatures.

It is not intended to have any great number of smaller animals for experimental purposes inside of the building, and for convenience the house for guinea pigs and rabbits has been placed immediately to the rear of the biological wing. It consists of two large rooms, together with two smaller ones for operating, and a vestibule. One of the large rooms is to be devoted to the storage of animals and to the keeping of those which are under observation but not infected with dangerous diseases. The other large room is completely isolated and screened and is intended for work with plague, smallpox, cholera, and other diseases which may become dangerous and which it is not safe to handle unless every precaution is taken.

On the ground floor of the biological wing one room is set aside for the mechanic. This is provided with power and a complete equipment of lathes, shapers, drills, grinders, and tools, so that the laboratories will be in a position to have their instruments made and repaired on the grounds.

The rooms of the chemical wing show much greater variations among themselves than do those of the biological portion, because successful chemical work needs a greater variety of apparatus and facilities. However the distinction between the biological and chemical laboratories of the present time is not so great as it formerly was, because biologists are now carrying their investigations into fields more closely allied to chemistry. Therefore the general desk arrangement of the chemical rooms is similar to that of those devoted to biology. They each contain a window desk, which is 36 inches high and 30 inches wide, built without the central small sinks but in their place equipped with a trough, sink, drip board, gas, water, and vacuum for general chemical work.

In some of the rooms, especially those devoted to mineral analysis, sugar and foods, etc., one end of this window desk is left free without incumbrance of any kind, for the purpose of permanently placing burettes for making titrations. The central large laboratory desk is placed in most of the chemical rooms just as it is in the biological laboratory, with this difference, that it has two central troughs connected with the large sink, is equipped with a reagent shelf in the middle, and is provided with the usual connections throughout its length for compressed air, water, and vacuum.¹

The hoods in the chemical laboratory are of necessity much larger than they are in those portions of the building devoted to other work, some of them being 9 and others 12 and even 15 feet in length. The size of the flue for each hood is calculated so as to equalize in all the time necessary to effect a change of air; throughout the building they are provided with rising sash and glass fronts and sides.²

All the hoods in the chemical wing have not only gas, water, and vacuum but also steam and steam-exhaust pipes, so that evaporations may be continuously carried on without vitiating the air of the rooms. The wall tables opposite the hoods are equipped much in the same manner as are those in the biological wing, but a number of them, in rooms where this is necessary, have pipes for air pressure and steam as well. Storage-battery connections are found on the desks of the rooms devoted to mineral analysis, physics, and weights and measures, spectrum analysis, and in the private laboratory of the Superintendent. It is intended to utilize electrolytic methods of analysis to the fullest extent when the building is in complete operation, and as in this class of work it is necessary not infrequently, owing to acid fumes, to have the apparatus set up outside of the general laboratory air, these connections were also placed in the hoods.

Certain rooms devoted to specific purposes vary somewhat from the general type. On the ground floor entering from the east the first one to the right is devoted to physics and physical chemistry. It is provided with a large central pier with cement posts above

¹ Pl. XIII is a photograph of the central desk in the chemical laboratory and Pl. XIV of the same class in the biological laboratory.

² Pl. XV is a photograph of one of the larger hoods in the chemical laboratory.

and a top 8 inches thick, built upon a foundation which extends 3 feet below the level of the ground, provided with a broad footing and carried up entirely clear of the building. At a distance of 10 feet from the main pier and on each side is a secondary one brought up from the ground in the same manner, the group of three forming a triangle. All of the stability necessary for electric and other work is obtained by this arrangement. On one side of the main physics room is an ordinary wall desk supplied with gas and water for the purpose of electric conductivity measurements and physical chemistry. It is provided with storage-battery connection and is to have a large permanent thermostat tank attached to one end.¹ Back of this main room to the east and connected with it by a doorway is a second one. It contains the ordinary wall desk and hood and is intended for the usual chemical work so necessary in a physical laboratory. Finally, to the east of the two just mentioned is a third for photometric work. It contains a long and heavy photometric table placed upon piers built in the same manner as the ones which have been described. The facilities in the division of weights, measures, and physics will be such that all classes of work needed in the adjustment of the weights and measures of the Islands can be carried on.

Across the hall from the rooms intended for physics and weights and measures is a large room to be used as a place for studying commercial processes. It has the usual central worktable and a long hood. One of the walls, differing from the general usage in the building, is occupied by a table on which are placed the shaking and stirring machines necessary for much of the work to be done in connection with the extraction of organic products. These machines are operated by a motor of one-half horsepower and are belt driven. The window desk is intended for distillations in which ether and other volatile inflammable substances are used, and as a consequence gas has been omitted from it, the heating being by means of steam only. At the east end is an alcove in which are placed various machines to be used in studying commercial processes. They consist of a copper still of 90 liters' capacity which is supplied with a steam jacket so arranged that either indirect or direct steam may be used. The apparatus is supplied with

¹ Pl. XVII is a photograph of the main room devoted to physics and physical chemistry.

vacuum connections, so that materials may be distilled *in vacuo* as well as under atmospheric pressure, and a double stopcock for the extraction of samples without interfering with the vacuum is attached. Next to this still stands a large extraction apparatus consisting of a boiler of 140 liters' capacity for the solvent. From this and extending to the extreme top is the exit tube connecting with the condenser, which is at the highest point; below this and between it and the still is mounted a receiving drum for the condensed solvents, and farther down and to one side is the extraction apparatus proper. This consists of a large kettle of 100 liters' capacity, steam jacketed to use heat if necessary, containing baskets for the placing of materials, and mounted on trunnions so that it may be tilted to empty and clean it. The entire apparatus is fitted with vacuum which is connected with the condenser above and the trunnions are so arranged that steam may be admitted through them into the extractor, which is fitted with the necessary safety valves to prevent accidents. A smaller still of 15 liters' capacity, on the same model as the large one, is also provided. All of this apparatus is of the make of Gustav Christ, of Berlin. In the alcove of this room besides the apparatus given above there are mounted a porcelain ball mill for the pulverizing of refractory materials and a drug mill for grinding, both operated by a one-half-horsepower motor with shafting and belting, a hydraulic press and a vacuum drying apparatus, the latter of the make of the American Vacuum Drying Company.¹

Crossing the hall and immediately to the west of the room for physics is the assay laboratory. This is provided with a large fire-brick table mounted on a pier and holding the main assay furnace from Braun & Co., Los Angeles, Cal., supplied with Cary hydrocarbon burners, the gasoline tank being placed in the ground outside the building so as to avoid all danger from fire. On each side of the main furnace are smaller ones, both muffle and crucible, of the Hoskins type. The main assay flue extends from these up to the roof and 15 feet above the latter. The corner of the assay room next the furnaces is occupied by a Braun crusher and pulverizer and a Bonnot ball mill, both operated by a 1-horsepower motor with shafting and belt. In the center of the room is a pier for the rolls and a large table for general work with samples. The

¹ Pl. XVIII is a photograph of the commercial apparatus described above.

other arrangements are like those of the chemical laboratory in general.¹

Next to the assay room is a balance room for the general use of the ground floor and for the button balances, and leading from this is the combustion room for organic ultimate analysis, containing two combustion tables and one side table supplied with gas and water for the bomb furnaces.

The storerooms are two in number and are provided with shelving extending from the ground to the ceiling. One room is intended for chemicals and the other for apparatus, the former being supplied with a small laboratory worktable and hood and a distilling apparatus connected with the main boilers and to be used for the purpose of making distilled water.

In the chemical wing on the second floor the only variations from the general type are found in the room to the east and farthest along the corridor, in which is placed a special desk with compartments for the polariscopes, and in the main balance room. The latter has one central pier running from the ground up and constructed in the same manner as the ones described above. Upon this is placed a heavy balance table capable of accommodating eight instruments.²

The photographer's room on the second floor immediately to the left of the main staircase is fitted with two dark rooms 8 by 10 feet with large leaded sinks, drip board, shelving, and tables, and on one side is the stand for the photomicrographic apparatus. This is built on a solid pier 10 feet long and 30 inches wide, constructed on the same principle as the others in the building and placed well into the ground on broad footings. The photomicrographic apparatus is of the latest Zeiss pattern, both stand and camera, and the source of light is a 90° Thompson arc light. The photographer is also supplied with 5 by 7 Graphic cameras with Zeiss series and A lenses, an 8 by 10 camera with Zeiss lens, as well as a Goertz anastigmat and enlarging camera and an apparatus for making lantern slides.³

The library consists of a main room connected on either side with the stack rooms. The librarian's desk is placed in the center

¹ Pl. XIX is a photograph of the furnaces and apparatus in the assay room.

² Pl. XX is a photograph of the balance room.

³ Pl. XXI is a photograph of the photographer's studio.

with the various files on either side, the reading room is in the alcove, and the book stacks are arranged on either side in the wings of the room and in the stack rooms. They are metal and of the type supplied by the Library Supply Company of Boston.¹

The serum laboratory in the power house has the same general arrangement of desks and hoods as the biological portion of the building. It needs no special description, with the exception of the serum kitchen, which contains a large, steam-supplied autoclave and sterilizer of the pattern made by Messrs. Bausch & Lomb, and a centrifugal from Lautenschlager, of Berlin, the latter driven by a four-horsepower motor. The serum laboratory also is provided with two large incubators of the same type as those used in the biological division. The vaccine stable is placed immediately next to the power house. It is fly-proof throughout, with cement floors and stalls for twenty calves and an operating room for inoculation and for collecting the virus. The calves in this place can be kept under thoroughly aseptic conditions. On the other side of the power house is located the building for small animals. The guinea pigs and rabbits will be kept in galvanized-iron cages placed on racks well in the center of the room to insure coolness. To the rear of the driveway is a horse stable of a capacity sufficient to accommodate twelve horses, fly-proof, as in the case of the building for vaccine calves. It contains an operating room which will make it possible to collect serums according to the most improved methods. The last building of all is a small, two-storied one for dogs, goats, and monkeys.

APPARATUS AND SUPPLIES.

In Manila the greatest difficulty encountered by a laboratory is to keep on hand a sufficiency of special supplies, and also to provide the apparatus which may be necessary. While the equipment may apparently be complete, nevertheless requests for new classes of work may suddenly bring the laboratories face to face with the necessity of purchasing new kinds of apparatus, and until these are delivered of refusing to do the work demanded. To procure stores from Europe or America takes at least seven months. As a result the equipment of a laboratory at such a distance from the base of supplies must be somewhat more extensive and complete

¹ Pls. XXII-XXVI are photographs of the library showing the metal stacks.

than it would be in Western countries, because when the emergency arises it is not possible immediately to procure the materials necessary for the work.

A large portion of the special apparatus has been mentioned in the course of the description of the building, so that only a brief review of the remaining equipment will be necessary. The laboratory is supplied with fifteen microscopes of the best pattern from Zeiss, of Jena, and with two microscopes for travelers from Leitz. All the necessary lenses to equip these instruments for ordinary work are at hand, and in addition there are a certain number of apochromatic 2-millimeter aperture 1.30 and 1.40 lenses. Ocular and stage micrometers, Abbé drawing cameras, and other accessories are of necessity a part of the equipment. The microtomes were bought from Schanze, of Berlin, and are five in number, besides which there are two Minot automatic instruments and one using carbon dioxide for work with frozen sections.

The incubators are of the manufacture of F. & M. Lautenschlager and are divided into two classes—the portable ones for the individual rooms and the larger ones. All the necessary apparatus for work in preparing sections is also at hand.

The museum is amply supplied with jars of all sizes, and the storerooms contain the necessary surgical instruments, post-mortem sets, and other appliances necessary for biological work.

The chemical balances are of the make of Sartorius, of Goettingen, and of Rueprecht, of Vienna. There is one precision balance weighing to five kilograms and another to ten, to be used in the standardizing of weights and measures. Both of these are of the make of Sartorius. The laboratory has also a normal kilogram and a normal set of weights from 500 grams downward from Rueprecht, and a chief normal thermometer from A. Haak, of Jena, from whom all of the laboratory thermometers have been purchased. It is also provided with a complete set of normal specific-gravity apparatus, alcoholimeters, and other appliances for work with specific gravity. Apparatus for electric conductivity measurements from Goetze, of Leipsic, has been purchased, as well as normal volume measures from the same firm. An electric furnace for 300 amperes current for obtaining high temperatures is also a part of the chemical equipment. The necessary routine apparatus, such as flasks, beakers, Petrie dishes, evaporating dishes, platinum ware, retort stands, lamps, filtering apparatus, vacuum

distilling flasks, condensers, etc., have been bought in sufficient quantity to meet all probable demands for the year, so that the laboratories are well equipped to meet emergencies. A detailed list of all the apparatus in the building would be too extensive for the present paper, nor would it be necessary, because the outline given above is sufficient to indicate the nature of the equipment.

CONCLUSION.

The Bureau of Government Laboratories, as the description given above will indicate, is now prepared to do all necessary work, and also to extend its field in the lines of investigation so essential for the success of any institution. The results of these investigations are being issued in a series of publications numbering up to the present time twenty-two. The list of these is given on the inside cover pages of this bulletin, and the range and variety of the work can best be judged by a perusal of the titles. One aim of the Bureau from the beginning has been to place itself in a position to attract to it foreign guests and students who may wish to come to Manila for the purpose of carrying on research work in which they are interested. To such investigators the doors of the laboratories will be open and the facilities of the Bureau will be at their disposal.

The scope of the library, as is shown by the librarian's description which follows, is such that no one need fear a lack of literature if he choose to carry on work in Manila. The Bureau, in the event that foreign investigators avail themselves of the privileges of the institution, will reserve to itself only the right of publishing their results as laboratory publications, however, without thereby in any way interfering with the desire of the investigators to send their work to the usual journals.

The Civil Government has given what it can to establish the Bureau on a proper basis. It has been most liberal in its support and in the encouragement of scientific work. However, it would seem as if an organization like the Bureau of Government Laboratories should also command the support of disinterested persons who wish to assist in the advance of science in general and in the Tropics in particular, and it is believed that the institution can be commended to such as one worthy of donations not only for specific but also for general purposes.

II. A CATALOGUE OF THE LIBRARY OF THE
BUREAU OF GOVERNMENT
LABORATORIES.

LETTER OF TRANSMITTAL.

DEPARTMENT OF THE INTERIOR,
BUREAU OF GOVERNMENT LABORATORIES,
OFFICE OF THE SUPERINTENDENT OF LABORATORIES,
Manila, P. I., February 14, 1905.

SIR: I have the honor to forward herewith, for publication as Part II of Bulletin No. 22, a catalogue of the Library of the Bureau of Government Laboratories, by Miss Mary Polk, librarian. It was thought that this catalogue would have been ready for publication in October, 1904, but, owing to the transfer during this month of 4,912 volumes from the other Bureaus of the Department of the Interior to the library of this Bureau, its issue has been delayed until the present time.

Very respectfully,

RICHARD P. STRONG,
*Director Biological Laboratory,
Acting Superintendent of Government Laboratories.*

HON. DEAN C. WORCESTER,
Secretary of the Interior, Manila, P. I.

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PART II.

A CATALOGUE OF THE LIBRARY OF THE BUREAU OF GOVERNMENT LABORATORIES.

By MARY POLK, *Librarian.*

INTRODUCTION.

The following is a brief sketch of the organization, growth, and present condition of the library of the Bureau of Government Laboratories:

ESTABLISHMENT.

Provision for a scientific reference library as a part of the Bureau of Government Laboratories, Manila, P. I., was made in Act No. 156 of the United States Philippine Commission passed July 1, 1901. The Superintendent of Government Laboratories was given charge over the purchase of books authorized for use in connection with all Government laboratories for the Philippine Islands and was asked to prepare and recommend, as a basis for appropriation, to the central legislative body of the Islands—

(a) Plans for a suitable building for the installation of the biological laboratory, the chemical laboratory, and a reference library.

(b) * * *

(c) * * *

(d) Detailed estimates of the cost of properly equipping the several laboratories and of procuring an adequate reference library, which shall be housed in the same building with the biological and chemical laboratories.

As the result of the presentation of such estimates, an agreement was entered into by which the library should receive the sum of \$45,290.66, United States currency, in quarterly, semiannual, or

annual installments, as best suited conditions existing at the times when appropriations were asked for. Act No. 389 of April 12, 1902, provided for the purchase of books not to exceed \$7,715.11, United States currency, and the first order under this appropriation was forwarded through the Insular Purchasing Agent May 21, 1902.

GROWTH AND PRESENT SIZE.

The nucleus of the library was formed by the transfer of about fifty books from the Board of Health and subscriptions for scientific periodicals for 1902, the latter beginning to arrive about July 1, 1902. The care of this material was so slight that the clerks of the Bureau took charge of it until the beginning of the year 1903, at which time the receipt of a large number of sets of periodicals and separate books and manuals, ordered during 1902, and the constantly growing list of subscriptions to current periodicals made it necessary for some one to assume the work of accessioning, classifying, cataloguing, and caring for the rapidly growing stock of books, periodicals, and pamphlets, and the writer was appointed librarian April 1, 1903.

The growth of the library has been steady, large orders being sent out two or three times during each year, and although the receipts have been delayed by long distance from the source of supply and the difficulty of finding in the market many of the sets of scientific periodicals ordered, the number of volumes on hand September 30, 1904, was 11,021, with outstanding orders for more than 70 sets of periodicals and about 250 other publications. Since that date 4,902 volumes have been added by transfer, 1,062 by purchase, and nearly 400, not previously included, by subscriptions for 1904, making a total number of more than 17,350 volumes on hand.

CHARACTER OF WORKS.

All works in the library are of a scientific character and represent the literature of the departments and divisions at present organized in the Bureau of Government Laboratories. The subscriptions to periodicals number about 250 and include many of the American, British, and continental chemical, biological, zoological, entomological, botanical, medical, photographic, library, microscopic, and general scientific periodicals, and the larger number of these have been on file since the establishment of the laboratories, the complete

sets being filled in as rapidly as funds become available. It has been the policy of the library to secure complete sets of journals in as many instances as possible in order that records of the history and development of scientific research may be available for reference by the investigators and for the routine work of the Bureau. The latest editions of scientific books and manuals have also been added, covering the work of the various divisions of the laboratory, and the list of dictionaries and general reference books includes English, German, French, Spanish, Italian, Dutch, Russian, Latin, and Greek dictionaries; the Index Medicus, complete; the Index Catalogue of the Surgeon-General's Library (Washington, D. C.), complete; Gould's Medical Dictionary and Encyclopedia; United States Dispensatory; Lippincott's Pronouncing Gazetteer; Polk's Medical Directory; Minerva; Roget's Thesaurus; International Catalogue of Scientific Literature; Reference Handbook of the Medical Sciences, etc.

The library has been augmented by the transfer of a number of books from other Bureaus. With the transfer of the Government botanist from the Bureau of Agriculture and the Bureau of Forestry to the Bureau of Government Laboratories a valuable collection of botanical books was added to the library. The Board of Health also added a number of volumes when the serum laboratory was transferred to this Bureau. For account of further transfers, see "Organization of a central scientific library" and "Supplemental list."

USE OF THE LIBRARY.

The legislation establishing the library as a part of the Bureau of Government Laboratories specified that it should be a reference library, and from the beginning the books have been on open shelves accessible for consultation by visitors. Lists of daily accessions have been available for reference, and as rapidly as possible shelf list and other helps in locating books on the shelves are being prepared. There is now adequate table room for readers, and attendants will furnish any book in the library on request.

As the work became better known it was found that there was a growing demand for books to be taken from the library, and at the beginning of the year 1904 arrangements were completed by which all persons employed in the various Departments of the Civil

Government might take books on borrowers' cards, subject to the provisions of the following library rules which went into effect January 1, 1904:

LIBRARY RULES.

The library of the Bureau of Government Laboratories is primarily a reference library. These library rules have been prepared so as to enable the Bureau to accommodate employees of other Bureaus needing scientific literature, but in order not to lose the reference character of the library it is necessary that the following library rules be rigidly enforced and exactly complied with:

RULE I. The library shall be open daily from 10 to 12 and from 3.30 to 5.30 for the purpose of loaning books, excepting on Sundays and holidays. On Saturdays it will be open for this purpose from 10 to 12 only. The library shall be open for reading purposes from 8 to 12 and from 2.30 to 5.30 on week days, from 8 to 12 on Saturdays, and from 9 to 12 on Sundays. It will be closed on holidays.

RULE II. The privilege of taking books, periodicals, and pamphlets from the library shall be restricted to employees of the Civil Government: *Provided*, That each employee who wishes to take books, periodicals, or pamphlets from the library shall present to the librarian on the first occasion when such employee draws a book, periodical, or pamphlet a certificate from the chief of his Bureau stating that the person desiring to draw books is a civil employee and in the opinion of such chief of Bureau is a proper person to have the privilege of drawing books, and that such chief of Bureau accedes to and is willing to enforce the library rules herein laid down. The employee shall also sign a statement that he is willing to adhere to and abide by such library rules as are herein laid down.

RULE III. No person shall take from the library more than two books, three numbers of current periodicals, and five pamphlets at any one time, and each person so taking books, periodicals, or pamphlets shall sign a receipt to the librarian, on a form provided for the purpose, for each and every book, periodical, or pamphlet drawn.

RULE IV. Books and pamphlets shall not be retained for a period greater than fourteen days; monthly periodicals and those appearing at less frequent intervals not more than five days.

RULE V. Any book, periodical, or pamphlet taken from the library shall be promptly returned to the library upon notice from the librarian that such book, periodical, or pamphlet is needed in the library, even though the time limit for keeping such book, periodical, or pamphlet may not have expired.

RULE VI. All books, periodicals, or pamphlets shall be returned directly to the librarian by the borrower, and under no circumstances shall they be returned to the shelf by the borrower.

RULE VII. Books, periodicals, or pamphlets used at the reading table shall be left on the table and not returned to the shelves by the borrower.

RULE VIII. The loan of any book, periodical, or pamphlet may be

renewed by any civil employee upon request to the librarian at the end of the time specified above under Rule IV: *Provided always*, That no demand for such book, periodical, or pamphlet shall have been made upon the librarian during the period in which the book has been out of the library.

RULE IX. By and with the consent of the Superintendent of Government Laboratories, a certain number of books needed for frequent reference may be withdrawn from circulation and retained upon the shelves of the library, such list to be revised and altered from time to time, as deemed expedient.

RULE X. Any civil employee retaining a book, periodical, or pamphlet beyond the time specified in Rule IV, provided the loan be not renewed to him by the librarian, will be subject to a fine of one peso (₱1), Philippine currency, for each book, periodical, or pamphlet so retained by him for each three days or fraction thereof over and above the time specified in Rule IV during which the book, periodical, or pamphlet has been retained.

RULE XI. Every civil employee borrowing books, periodicals, or pamphlets from the library shall be responsible for any damage to the same or for the loss of the same, and charges for such loss or damage shall be assessed by the librarian as follows:

(a) *For loss or destruction.*—For each text-book, manual, or other single volume, and for each volume not older than three years belonging to a set, twice its value as advertised by the publisher or as shown by the bills paid, and for each volume older than three years belonging to a set, five times its value as advertised by the publisher or as shown by the bills paid.

(b) *Loss by damage.*—All loss by damage to books, periodicals, or pamphlets shall be assessed by the librarian and charged accordingly: *Provided, however*, That if, in the opinion of the librarian, the damage is such as to require the purchase of a new book, then the charge shall be assessed as in class (a) of this rule.

RULE XII. All moneys due to the Bureau of Government Laboratories by reason of the application of the foregoing rules, if not paid within two weeks after sending of notice from the librarian, shall be recovered through the disbursing officer of the Bureau to which the civil employee belongs, by application by the Superintendent of Government Laboratories for such moneys.

RULE XIII. The privilege of borrowing books from the library by any civil employee may be withdrawn by the Superintendent of Government Laboratories if the latter is satisfied that such civil employee is not adhering to library rules, or is careless in the handling of books.

RULE XIV. The provisions of the foregoing rules apply to civil employees stationed in Manila. Under no circumstances will books be loaned for use outside of Manila.

LOCATION.

The library is now permanently located in the new Government Laboratory, Calle Herran, and occupies the middle rooms in the front of the building, having a floor space 86 by 24 feet, with an



extension 26 by 13 feet in the center, in which are placed the shelves for current numbers of periodicals, map and chart case, and reading tables. Two side rooms each 24 by 16 feet and three alcoves each approximately 13 feet square contain book stacks of modern construction, entirely of metal with adjustable wooden shelves 8 and 10 inches wide. The main central room contains the librarian's desk, two sixty-drawer card cabinet files, and two revolving book-cases. The space in front of these is left open and can be utilized excellently for scientific meetings.¹

CLASSIFICATION AND CATALOGUING.

From the beginning a catalogue of books by author and title, of periodicals by titles alphabetically arranged, a business record of books ordered and received, and an accession book for periodicals have been kept. An accession book for all additions to the library is partially compiled and when completed will give complete data concerning all the books and periodicals.

The books and periodicals are arranged on the shelves according to the Dewey system of classification very slightly modified, and a shelf list is arranged for a portion of the library. This shelf list, numbered and arranged by the Dewey classification method, is at the same time a subject catalogue of the library, all publications on a certain subject coming under the same number. For example, all works on general science fall under 500, those on chemistry under 540, those on medicine under 610, those on photography under 770, etc. The books will be made still easier of access by placing in each one and on every card referring to it a combination of four numbers which will show the exact shelf on which the book is located. For example, "1/10/3/6" placed in a book and on a card means that this volume may be found in room (or alcove) No. 1, on stack face No. 10, division No. 3, and shelf No. 6, counting from the floor. This method tells the reader at a glance on which 3-foot shelf in the library the volume desired is located.

No subject or dictionary catalogue has as yet been inaugurated, this being an impossibility until more assistants have been employed and time taken for their training.

¹ See floor plan and photographs.

EXCHANGES.

The library receives continually a large number of exchanges from scientific institutions, many as monographs and others in periodical form. Where these are complete publications, or if periodical, when the current numbers are received regularly, they have been listed in this catalogue. As rapidly as these sets are completed they will be published in supplementary lists.

CATALOGUES.

The library has collected from time to time a large number of catalogues of (1) leading American colleges and universities, (2) leading manufacturers of laboratory and scientific apparatus and supplies, and (3) American, British, and continental book dealers and publishers. These are indexed by the card system and where unbound are protected by pamphlet cases. They are at all times available for use in the reference room and for circulation under the regular library rules.

MAPS AND CHARTS.

A number of charts of harbor and coast lines of Philippine waters issued by the Coast and Geodetic Survey, and maps published by the Military Information Division, Office of the Chief of Staff, War Department, Washington, D. C., and Manila, P. I., have been presented to the library during the past two years, but until recently no adequate way of caring for them had been arranged. A large native hard-wood case containing eight drawers 4 by 5 feet in size and $2\frac{1}{2}$ inches deep, lately placed in the reading room, provides an excellent place for caring for and consulting this class of material. An effort will be made to secure other maps and charts, especially those of local interest, and a list will be published when the collection is more complete.

GOVERNMENT PUBLICATIONS.

Some 3,500 Government publications, including those of various Departments of the United States and of the Bureaus of the Philippine Government, as well as many foreign government reports, are on file and are indexed by the card system according to title and department number under which they are published. It is desired to complete many of these sets before including them by

title in a printed list, as many sets have numbers missing which we hope it may be possible to secure by further correspondence.

ORGANIZATION OF A CENTRAL SCIENTIFIC LIBRARY.

On October 20, 1904, at the call of the honorable the Secretary of the Interior, a meeting of the chiefs of the various Bureaus of the Department of the Interior was held in the reading room of the library and plans completed for establishing a central card catalogue for all scientific publications belonging to the various Bureaus of this Department. All books and periodicals at that time in these different Bureaus were to be transferred to the Bureau of Government Laboratories, where accurate data for publishing a printed catalogue and for inaugurating a comprehensive card catalogue should be collected, after which all works needed for constant reference in the various offices could be returned to the individual Bureaus on memorandum receipt signed by the chief of the Bureau and approved by the Secretary of the Interior.

Resulting from this arrangement 4,902 volumes have been transferred to the Bureau of Government Laboratories and information cards made from them containing data for issuing a printed bulletin, for entering these titles in the library accession book, and for establishing an author-title card index, each card referring to any one of these publications showing in what Bureau or Office the volume may be found if it has been taken from the library on memorandum receipt. These works have all been included by title in the present bulletin, except in the case of a considerable amount of miscellaneous material similar to that discussed under "Exchanges" and "Government publications" above, received from the Bureau of Public Health, the Public Health and Marine-Hospital Service, the Philippine Civil Hospital, the Bureau of Public Lands, the Bureau of Agriculture, the Mining Bureau, the Bureau of Forestry and the Ethnological Survey.

In the collection and classification of the material for these supplemental lists much valuable assistance has been given by Mr. C. J. Arnell, stenographer of the biological laboratory.

Throughout this catalogue titles have been quoted in the language of the publication as far as possible. In a very few cases titles in Japanese, Russian, and Hindustani have been translated into English and one Greek subtitle into Latin. In the case of the Japanese publications transliteration of the original title has also been given.

In the following periodical lists a number of publications not ordinarily classed as periodicals have been included. All serial publications are carried on the business records of the library as periodicals, and many of these are used in such a way that it has not seemed well to make a division here, hence all have been included. Practically all titles of serial works appear also in the lists of books under their appropriate subject classifications.

Certain journals are frequently called for by the name of the editor—*e. g.*, Koch's Jahresbericht, Grafe's Archiv, Hoppe-Seyler's Zeitschrift, etc. In the alphabetical lists these have original entries which follow title page of periodical, with cross references to other forms.

For convenience in consulting periodical lists two arrangements, one alphabetical and the other by subject, have been included in this catalogue. In lists arranged by subject the titles appear according to the language (or country) in which the periodical is published, in the following order: American, English, German, French, other languages (or countries). Publications of learned societies follow regular periodical publications. Cross references are not considered necessary in lists arranged by subject.

In lists of complete sets of periodicals both inclusive volume numbers and inclusive years of publication are considered worth giving, since references to literature are far from uniform in this respect.

LISTS.

LIST OF CURRENT PERIODICALS ARRANGED ALPHABETICALLY.

- Allgemeine botanische Zeitschrift, Karlsruhe, 8°.
Allgemeine botanische Zeitung. *See* Flora.
American Annual of Photography and Photographic Times-
Bulletin Almanac, New York, 8°.
American Chemical Journal, Baltimore, 8°.
American Journal of the Medical Sciences, Philadelphia and New
York, 8°.
American Journal of Physiology, Boston, 8°.
American Journal of Science (Silliman), New Haven, 8°.
American Medicine, Philadelphia, 4°.
American Veterinary Review, New York, 8°.
Anatomische Hefte (Merkel und Bonnet. Beiträge und Referate
zur Anatomie und Entwicklungsgeschichte, part 1), Wies-
baden, 8°.
Anatomischer Anzeiger, Jena, 8°.
Annalen der Chemie. *See* Liebig's Annalen der Chemie.
Annalen der Physik, Leipzig, 8°.
Annales de chimie et de physique, Paris, 8°.
Annales de l'Institut Pasteur, Paris, 8°.
Annales de la Société entomologique de Belgique, Bruxelles, 8°.
Annales de la Société entomologique de France, Paris, 8°.
Annales des sciences naturelles, Botanique, Paris, 8°.
Annales du Jardin botanique de Buitenzorg, Leide, 8°.
Annali d'igiene sperimentale, Milano-Torino-Roma-Napoli, 8°.
Annals of Botany (Balfour), London, 8°.
Annals of the Royal Botanic Garden, Calcutta, 4°.
Annotationes zoologicae Japonenses (Nihon Dobutsugaku Iho),
Tokyo, 8°.
Arbeiten aus dem kaiserlichen Gesundheitsamte, Berlin, 8°.

Archiv der Pharmacie, Berlin, 8°.

Archiv für Anatomie und Physiologie (Anatomische Abtheilung = Archiv für Anatomie und Entwicklungsgeschichte; Physiologische Abtheilung = Archiv für Physiologie), Leipzig, 8°.

Archiv für Dermatologie und Syphilis, Wien und Leipzig, 8°.

Archiv für experimentelle Pathologie und Pharmakologie, Leipzig, 8°.

Archiv für Hygiene, München und Berlin, 8°.

Archiv für klinische Chirurgie (Langenbeck), Berlin, 8°.

Archiv für mikroskopische Anatomie und Entwicklungsgeschichte, Bonn, 8°.

Archiv für Ophthalmologie. *See* Graefe's Archiv.

Archiv für pathologische Anatomie, etc. *See* Virchow's Archiv.

Archiv für Schiffs- und Tropen-Hygiene (Mense), Leipzig, 8°.

Archiv für Verdauungskrankheiten, Berlin, 8°.

Archiv für wissenschaftliche und praktische Thierheilkunde, Berlin, 8°.

Archives d'anatomie microscopique, Paris, 8°.

Archives de biologie (Beneden et Bambeke), Liège et Paris, 8°.

Archives italiennes de biologie, Turin, 8°.

Archives générales de médecine, Paris, 8°.

Archives de médecine expérimentale et d'anatomie pathologique, Paris, 8°.

Archives de médecine navale, Paris, 8°.

Archives médicales de Toulouse, Toulouse et Paris, 8°.

Archives de parasitologie (Blanchard), Paris, 8°.

Archives des sciences biologiques, St.-Petersbourg, 8°.

Archivio di biologia normale e patologica. *See* Sperimentale.

Archivio per le scienze mediche, Torino, 8°.

Association Medical Journal. *See* British Medical Journal.

Atlas of Illustrations of Clinical Medicine, Surgery and Pathology (New Sydenham Society), London, 4°.

Balfour's Annals of Botany. *See* Annals of Botany.

Baumgarten's Jahresbericht. *See* Jahresbericht . . . von den pathogenen Mikroorganismen.

Beihefte zum botanischen Centralblatt, Jena, 8°.

Beiträge zur pathologischen Anatomie und zur allgemeinen Pathologie (Ziegler), Jena, 8°.

Beneden et Bambeke's Archives. *See* Archives de biologie.

Berichte der deutschen botanischen Gesellschaft, Berlin, 8°.

- Berichte der deutschen chemischen Gesellschaft, Berlin, 8°.
- Berliner entomologische Zeitschrift, Berlin, 8°.
- Berliner klinische Wochenschrift, Berlin, 4°.
- Berliner tierärztliche Wochenschrift, Berlin, 4°.
- Bibliographia zoologica. *See* Zoologischer Anzeiger.
- Biedermann's Central-Blatt. *See* Central-Blatt für Agrikulturchemie.
- Biochemisches Centralblatt, Leipzig, 8°.
- Biological Bulletin of the Marine Biological Laboratory, Woods Holl, Mass., Lancaster, Pa., 8°.
- Biologisches Centralblatt (Rosenthal), Leipzig, 8°.
- Blanchard's Archives. *See* Archives de parasitologie.
- Boston Medical and Surgical Journal, Boston, 4°.
- Botanical Gazette, Chicago, 8°.
- Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie (Engler), Leipzig, 8°.
- Botanische Zeitung, Leipzig, 4°.
- Botanischer Jahresbericht. *See* Just's Botanischer Jahresbericht.
- Botanisches Centralblatt, Leiden, 8°.
- British Journal of Dental Science, London, 8°.
- British Medical Journal (Association Medical Journal), London, 8°.
- Bulletin de l'Académie de médecine, Paris, 8°.
- Bulletin de l'Herbier Boissier, Genève, 8°.
- Bulletin de l'Institut Pasteur, Paris, 8°.
- Bulletin de la Société chimique de Paris, 8°.
- Bulletin de la Société entomologique, Paris, 8°.
- Bulletin of the British Ornithologist's Club, London, 8°.
- Bulletin of the Johns Hopkins Hospital, Baltimore, 4°.
- Bulletin of the Torrey Botanical Club, Lancaster, Pa., 8°.
- Bulletins of the Bureau of Government Laboratories, Manila, 8°.
- Bulletins of the Hygienic Laboratory, Public Health and Marine-Hospital Service of the United States, Washington, 8°.
- Bullettino delle scienze mediche, Bologna, 8°.
- Canadian Entomologist, London, Ontario, 8°.
- Carus' Anzeiger. *See* Zoologischer Anzeiger.
- Central-Blatt für Agrikulturchemie (Biedermanns), Leipzig, 8°.
- Centralblatt für allgemeine Pathologie und pathologische Anatomie (Ziegler), Jena, 8°.

- Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten, part 1, Originale and Referate, part 2, Jena, 8°.
- Centralblatt für Gynäkologie, Leipzig, 8°.
- Centralblatt für innere Medicin, Leipzig, 8°.
- Centralblatt für die medicinischen Wissenschaften, Berlin, 8°.
- Chemical News and Journal of Physical Science, London, 4°.
(With no. 1, vol. 1, Chemical Gazette was incorporated with this journal.)
- Chemische Industrie, Berlin, 4°.
- Chemisches Central-Blatt, Berlin, 8°.
- Comptes rendus . . . de l'Académie des sciences, Paris, 4°.
- Comptes rendus . . . de la Société de biologie, Paris, 8°.
- Contributions from the United States National Herbarium, Washington, 8°.
- Correspondenz-Blatt für Zahnärzte, Berlin, 8°.
- Curtis's Botanical Magazine, London, 8°.
- De Dalla Torre et Harms' Genera siphonogamarum. *See* Genera siphonogamarum.
- Dental Cosmos, Philadelphia, 8°.
- Dental Era, St. Louis, 8°.
- Dental Review, Chicago, 8°.
- Deutsche medicinische Wochenschrift, Berlin, 4°.
- Deutsche tierärztliche Wochenschrift, Hannover, 4°.
- Deutsches Archiv für klinische Medicin, Leipzig, 8°.
- Engineering and Mining Journal, New York, 4°.
- Engler's Botanische Jahrbücher. *See* Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie.
- Engler. Das Pflanzenreich. *See* Pflanzenreich.
- Entomological News, Philadelphia, 8°.
- Entomologische Zeitschrift, Guben, 4°.
- Entomologisk Tidskrift, Stockholm, 8°.
- Entomologist, London, 8°.
- Entomologist's Monthly Magazine, London, 8°.
- Ergebnisse der allgemeinen Pathologie (Lubarsch-Ostertag), Wiesbaden, 8°.
- Exotische Käfer (Heyne), Leipzig, 4°.
- Exotische Schmetterlinge (Hübner), Leipzig, 4°.
- Experiment Station Record (United States Department of Agriculture), Washington, 8°.

Fischer's Jahres-Bericht. *See* Jahres Bericht der . . . chemischen Technologie.

Flora, oder Allgemeine botanische Zeitung, Marburg, 8°.

Gardeners' Chronicle. *See* Supplemental list, Bureau of Agriculture.

Gazette des hôpitaux, Paris, 4°.

Gazette hebdomadaire des sciences médicales de Bordeaux, 4°.

Gazette médicale de Paris, 4°.

Gazzetta chimica italiana, Roma, 8°.

Gazzetta medica di Roma, 8°.

Genera insectorum (Wytsman), Bruxelles, 4°.

Genera siphonogamarum (De Dalla Torre et Harms), Leipzig, 4°.

Giornale della reale Società ed Accademia veterinaria italiana, Torino, 8°.

Graefe's Archiv für Ophthalmologie, Leipzig, 8°.

Hare, Progressive Medicine. *See* Progressive Medicine.

Hedwigia. Organ für Kryptogamenkunde und Phytopathologie, Dresden, 8°.

Hermann's Jahresbericht. *See* Jahresbericht . . . der Physiologie.

Heyne's Exotische Käfer. *See* Exotische Käfer.

Hooker's Icones plantarum, London, 8°.

Hoppe-Seyler's Zeitschrift für physiologische Chemie, Strassburg, 8°.

Hübner's Exotische Schmetterlinge. *See* Exotische Schmetterlinge.

Hygienische Rundschau, Berlin, 8°.

Ibis, a Quarterly Journal of Ornithology, London, 8°.

Index Catalogue of the Library of the Surgeon-General's Office, United States Army, 2. series, Washington, 8°.

Index Kewensis plantarum phanerogamarum, 1. and 2. supplements, Brussels and Oxford, 4°.

Index Medicus, 2. series, Washington, 8°.

India Rubber World, New York, 4°.

Indian Forester. *See* Supplemental list, Bureau of Agriculture and Bureau of Forestry.

Indian Lancet, Calcutta, 4°.

Indian Medical Gazette, Calcutta, 4°.

International Catalogue of Scientific Literature, London, 8°.

International Clinics, Philadelphia, 8°.

International Dental Journal, Philadelphia, 8°.

Items of Interest, New York, 8°.

Jahrbuch der Chemie (Meyer), Braunschweig, 8°.

Jahrbücher der in- und ausländischen gesammten Medicin. *See* Schmidt's Jahrbücher.

Jahrbücher für wissenschaftliche Botanik (Pringsheim), Leipzig, 8°.

Jahresbericht der Pharmacie, Göttingen, 8°.

Jahresbericht über die Fortschritte der Agriculturchemie, Berlin, 8°.

Jahresbericht über die Fortschritte der Chemie und verwandten Teile anderer Wissenschaften (Liebig und Kopp), Braunschweig, 8°.

Jahresbericht über die Fortschritte in der Lehre von den Gärungs-Organismen (Koch), Leipzig, 8°.

Jahresbericht über die Fortschritte in der Lehre von den pathogenen Mikroorganismen (Baumgarten), Leipzig, 8°.

Jahresbericht über die Fortschritte der Physiologie (Hermann), Stuttgart, 8°.

Jahresbericht über die Fortschritte der Tier-Chemie, oder der physiologischen und pathologischen Chemie, Wiesbaden, 8°.

Jahresbericht über die Fortschritte und Leistungen auf dem Gebiete der Hygiene (Uffelmann), Braunschweig, 8°.

Jahres-Bericht über die Leistungen der chemischen Technologie (Fischer), Leipzig, 8°.

Jahresbericht über die Leistungen und Fortschritte in der gesammten Medicin (Waldeyer und Posner) Berlin, 8°. *Continuation of* Virchow und Hirsch's Jahresbericht.

Johns Hopkins Hospital Reports, Baltimore, 8°.

Journal de l'anatomie et de la physiologie normales et pathologiques, Paris, 8°.

Journal de botanique, Paris, 8°.

Journal d'hygiene, Paris, 4°.

Journal de médecine de Paris, 4°.

Journal de médecine vétérinaire et de zootechnie, Lyon, 8°.

Journal de physiologie et de pathologie générale, Paris, 8°.

Journal für praktische Chemie, Leipzig, 8°.

Journal of the American Chemical Society, Easton, Pa., 8°.

Journal of the American Medical Association, Chicago, 4°.

Journal of the Asiatic Society of Bengal, Calcutta, 8°.

- Journal of Bacteriology (Saikingaku Zasshi), Tokyo, 8°.
- Journal of Botany, British and Foreign, London, 8°.
- Journal of the Chemical Society, London, 8°.
- Journal of Comparative Pathology and Therapeutics, Edinburgh and London, 8°.
- Journal of Cutaneous Diseases including Syphilis, New York, 8°.
- Journal of Experimental Medicine, Baltimore, 8°.
- Journal of Hygiene, Cambridge, 8°.
- Journal of Infectious Diseases, Chicago, 8°.
- Journal of the Linnean Society, Botany, London, 8°.
- Journal of Medical Research, Boston, 8°.
- Journal of Mycology, Columbus, Ohio, 8°.
- Journal of Pathology and Bacteriology, Edinburgh and London, 8°.
- Journal of the Royal Microscopical Society, London, 8°.
- Journal of the Society of Chemical Industry, London, 8°.
- Journal of Tropical Medicine, London, 8°.
- Just's Botanischer Jahresbericht, Leipzig, 8°.
- Kew Bulletin of Miscellaneous Information, London, 8°.
- Klinisches Jahrbuch, Jena, 8°.
- Koch's Jahresbericht. *See* Jahresbericht . . . von den Gährungs-Organismen.
- Koch und Flügge's Zeitschrift. *See* Zeitschrift für Hygiene und Infektionskrankheiten.
- Lancet, London, 4°.
- Lancette française, Gazette des hôpitaux civils et militaires. *See* Gazette des hôpitaux.
- Langenbeck's Archiv. *See* Archiv für klinische Chirurgie.
- Library Journal, New York, 8°.
- Liebig's Annalen der Chemie, Leipzig, 8°.
- Liebig und Kopp's Jahresbericht. *See* Jahresbericht über die Fortschritte der Chemie, etc.
- Lubarsch-Ostertag's Ergebnisse. *See* Ergebnisse der allgemeinen Pathologie.
- Malpighia, Genova, 8°.
- Mededeelingen uit 'sLands Plantentuin, Batavia, 8°.
- Medical Library and Historical Journal, Brooklyn, N. Y., 8°.
- Medical News, New York, 8°.
- Medical Record, New York, 4°.
- Medical Review, London, 8°.

- Medical Review of Reviews, New York and London, 8°.
- Memoirs from the Biological Laboratory of the Johns Hopkins University, Baltimore, 8°.
- Mense's Archiv. *See* Archiv für Schiffs- und Tropen-Hygiene.
- Meyer's Jahrbuch der Chemie. *See* Jahrbuch der Chemie.
- Missouri Botanical Garden Reports, St Louis, 8°.
- Mittheilungen aus der medicinischen Facultät der kaiserlich-japanischen Universität zu Tokio (Teikoku Daigaku Kiyo Iken), Tokyo, 8°.
- Monatshefte für Chemie, Wien, 8°.
- Monatshefte für praktische Dermatologie (Unna und Taenzer), Hamburg, 8°.
- Montreal Medical Journal, Montreal, 8°.
- Münchener medicinische Wochenschrift, München, 4°.
- Nature, London, 4°.
- New York Medical Journal and Philadelphia Medical Journal, New York, 4°.
- Northwest Medicine, Seattle, Wash., 8°.
- Nothnagel's Encyclopedia of Practical Medicine, Philadelphia and London, 8°.
- Notizblatt des königl. botanischen Gartens und Museums zu Berlin, Leipzig, 8°.
- Oesterreiche botanische Zeitschrift, Wien, 8°.
- Oesterreiche Chemiker-Zeitung, Wien, 4°.
- Oesterreiche Monatschrift für Tierheilkunde, Wien, 8°.
- Pacific Dental Gazette, San Francisco, 8°.
- Pennsylvania Medical Journal, Athens, Pa., 8°.
- Pflanzenreich (Engler), Leipzig, 8°.
- Philosophical Transactions of the Royal Society of London, 4°.
- Photographic Times-Bulletin, New York, 8°.
- Photographische Mittheilungen, Berlin, 8°.
- Prager medicinische Wochenschrift, Prag, f°.
- Presse médicale, Paris, f°.
- Pringsheim's Jahrbücher. *See* Jahrbücher für wissenschaftliche Botanik.
- Proceedings of the Entomological Society of Washington, 8°.
- Proceedings of the Royal Society of London, London, 8°.
- Progrès dentaire, Paris, 8°.

- Progrès médical, Paris, 4°.
 Progressive Medicine (Hare), Philadelphia and New York, 8°.
 Public Health Reports (United States Public Health and Marine-Hospital Service), Washington, 8°.
 Public Libraries, Chicago, 8°.
 Quarterly Circular, London, 8°.
 Quarterly Journal of Microscopical Science, London, 8°.
 Records of the Botanical Survey of India, Calcutta, 8°.
 Recueil de médecine vétérinaire, Paris, 8°.
 Recueil des travaux chimiques des Pays-Bas et de la Belgique, Leide, 8°.
 Revue d'entomologie, Caen, 8°.
 Revue de médecine, Paris, 8°.
 Revue mycologique, Toulouse, 8°.
 Rockefeller Institute Studies. *See* Studies from the Rockefeller Institute for Medical Research.
 Rosenthal's Centralblatt. *See* Biologisches Centralblatt.
 Russkii Vrach, St. Petersburg, 4°.
 Sammlung chemischer und chemisch-technischer Vorträge (Ahrens), Stuttgart, 8°.
 Schmidt's Jahrbücher der in- und ausländischen gesammten Medicin, Leipzig, 4°.
 Schweizer-Archiv für Tierheilkunde, Zürich, 8°.
 Science, a weekly journal devoted to the advancement of science publishing the official notices and proceedings of the American Association for the Advancement of Science, Lancaster, Pa., 4°.
 Scientific Memoirs by Officers of the Medical and Sanitary Departments of the Government of India, Calcutta, 4°.
 Semaine médicale, Paris, 4°.
 Silliman's Journal of Science. *See* American Journal of Science.
 Sitzungsberichte der kaiserlichen Akademie der Wissenschaften, mathematisch-naturwissenschaftliche Klasse, Wien, 8°.
 Sperimentale = Archivio di biologia normale e patologica, Firenze, 8°.
 Stettiner entomologische Zeitung, Stettin, 8°.
 St. Louis and Canadian Photographer, St. Louis, 8°.
 St. Petersburger medicinische Wochenschrift, St. Petersburg, 4°.
 Stomatologiai Közlöny, Budapest, 8°.

- Studies from the Rockefeller Institute for Medical Research, New York, 8°.
- Therapeutic Gazette, Detroit, 8°.
- Tierärztliche Rundschau, Friedenau-Berlin, 4°.
- Tierärztliches Centralblatt, Wien, 8°.
- Transactions of the American Entomological Society, Philadelphia, 4°.
- Transactions of the American Microscopical Society, Lancaster, Pa., 8°.
- Transactions of the Entomological Society of London, 8°.
- Transactions of the Linnean Society, 2. series, Botany, London, 4°.
- Uffelmann's Jahresbericht. *See* Jahresbericht . . . auf dem Gebiete der Hygiene.
- Univ. of Penna. Medical Bulletin, Philadelphia, 4°.
- Unna und Taenzer's Monatshefte. *See* Monatshefte für praktische Dermatologie.
- Virchow's Archiv für pathologische Anatomie und Physiologie und für klinische Medicin, Berlin, 8°.
- Virchow und Hirsch's Jahresbericht. *See* Jahresbericht . . . der gesamten Medicin.
- Waldeyer und Posner's Jahresbericht. *See* Jahresbericht . . . der gesamten Medicin.
- Wiener entomologische Zeitung, Wien, 8°.
- Wiener klinische Wochenschrift, Wien, 4°.
- Wiener medicinische Wochenschrift, Wien, 4°.
- Wytsman's Genera insectorum. *See* Genera insectorum.
- Zeitschrift für analytische Chemie, Wiesbaden, 8°.
- Zeitschrift für angewandte Chemie, Berlin, 4°.
- Zeitschrift für angewandte Mikroskopie, Leipzig, 8°.
- Zeitschrift für anorganische Chemie, Hamburg und Leipzig, 8°.
- Zeitschrift für Biologie, München und Berlin, 8°.
- Zeitschrift für Entomologie, Berlin, 8°.
- Zeitschrift für Hygiene und Infektionskrankheiten (Koch und Flügge), Leipzig, 8°.
- Zeitschrift für Hymenopterologie und Dipterologie, Teschendorf i. Mecklenburg, 8°.
- Zeitschrift für Instrumentenkunde, Berlin, 8°.
- Zeitschrift für klinische Medicin, Berlin, 8°.

- Zeitschrift für öffentliche Chemie, Plauen i. V., 8°.
 Zeitschrift für Pflanzenkrankheiten, Stuttgart, 8°.
 Zeitschrift für physikalische Chemie, Leipzig, 8°.
 Zeitschrift für physiologische Chemie. *See* Hoppe-Seyler's Zeitschrift für physiologische Chemie.
 Zeitschrift für Thiermedizin, Jena, 8°.
 Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 8°.
 Zeitschrift für Veterinärkunde, Berlin, 8°.
 Zeitschrift für wissenschaftliche Mikroskopie, Leipzig, 8°.
 Zeitschrift für wissenschaftliche Zoologie, Leipzig, 8°.
 Ziegler's Beiträge. *See* Beiträge zur pathologischen Anatomie, etc.
 Ziegler's Centralblatt. *See* Centralblatt für allgemeine Pathologie, etc.
 Zoological Record, London, 8°.
 Zoologischer Anzeiger, Leipzig, 8°.

LIST OF CURRENT PERIODICALS ARRANGED BY SUBJECT.

GENERAL SCIENCE AND MICROSCOPY.

- American Journal of Science (Silliman), New Haven, 8°.
 International Catalogue of Scientific Literature, London, 8°.
 Science, a weekly journal devoted to the advancement of science publishing the official notices and proceedings of the American Association for the Advancement of Science, Lancaster, Pa., 4°.
 Journal of the Asiatic Society of Bengal, Calcutta, 8°.
 Nature, London, 4°.
 Zeitschrift für angewandte Mikroskopie, Leipzig, 8°.
 Zeitschrift für wissenschaftliche Mikroskopie, Leipzig, 8°.
 Transactions of the American Microscopical Society, Lancaster, Pa., 8°.
 Journal of the Royal Microscopical Society, London, 8°.
 Philosophical Transactions of the Royal Society of London, 4°.
 Proceedings of the Royal Society of London, 8°.
 Sitzungsberichte der kaiserlichen Akademie der Wissenschaften, mathematisch-naturwissenschaftliche Klasse, Wien, 8°.
 Comptes rendus . . . de l'Académie des sciences, Paris, 4°.

PHYSICS AND CHEMISTRY.

- Annalen der Physik, Leipzig, 8°.
Zeitschrift für Instrumentenkunde, Berlin, 8°.
Annales de chimie et de physique, Paris, 8°.
American Chemical Journal, Baltimore, 8°.
Chemical News and Journal of Physical Science, London, 4° (with
no. 1, vol. 1, Chemical Gazette was incorporated with this
journal).
Chemisches Central-Blatt, Berlin, 8°.
Jahrbuch der Chemie (Meyer), Braunschweig, 8°.
Jahresbericht über die Fortschritte der Chemie und verwandter
Theile anderer Wissenschaften (Liebig und Kopp), Braun-
schweig, 8°.
Jahresbericht über die Fortschritte der Tier-Chemie oder der
physiologischen und pathologischen Chemie, Wiesbaden, 8°.
Journal für praktische Chemie, Leipzig, 8°.
Liebig's Annalen der Chemie, Leipzig, 8°.
Monatshefte für Chemie, Wien, 8°.
Oesterreiche Chemiker-Zeitung, Wien, 4°.
Sammlung chemischer und chemisch-technischer Vorträge
(Ahrens), Stuttgart, 8°.
Zeitschrift für analytische Chemie, Wiesbaden, 8°.
Zeitschrift für angewandte Chemie, Berlin, 4°.
Zeitschrift für anorganische Chemie, Hamburg und Leipzig, 8°.
Zeitschrift für öffentliche Chemie, Plauen i. V., 8°.
Zeitschrift für physikalische Chemie, Leipzig, 8°.
Zeitschrift für Untersuchung der Nahrungs- und Genussmittel,
Berlin, 8°.
Recueil des travaux chimiques des Pays-Bas et de la Belgique,
Leide, 8°.
Gazzette chimica italiana, Roma, 8°.
Journal of the American Chemical Society, Easton, Pa., 8°.
Journal of the Chemical Society, London, 8°.
Berichte der deutschen chemischen Gesellschaft, Berlin, 8°.
Bulletin de la Société chimique de Paris, 8°.
Central-Blatt für Agrikulturchemie (Biedermanns), Leipzig, 8°.
Jahresbericht über die Fortschritte der Agrikulturchemie, Ber-
lin, 8°.
Chemische Industrie, Berlin, 4°.

- Jahresbericht über die Leistungen der chemischen Technologie (Fischer), Leipzig, 8°.
 Journal of the Society of Chemical Industry, London, 8°.

BIOLOGY.

- Biochemisches Centralblatt, Leipzig, 8°.
 Biological Bulletin of the Marine Biological Laboratory, Woods Holl, Mass., Lancaster, Pa., 8°.
 Quarterly Journal of Microscopical Science, London, 8°.
 Biologisches Centralblatt (Rosenthal), Leipzig, 8°.
 Zeitschrift für Biologie, München und Berlin, 8°.
 Archives de biologie (Beneden et Bambeke), Liège et Paris, 8°.
 Archives italiennes de biologie, Turin, 8°.
 Memoirs from the Biological Laboratory of the Johns Hopkins University, Baltimore, 8°.
 Archives des sciences biologiques, St.-Pétersbourg, 8°.
 Comptes rendus . . . de la Société de biologie, Paris, 8°.

BOTANY.

- Botanical Gazette, Chicago, 8°.
 Bulletin of the Torrey Botanical Club, Lancaster, Pa., 8°.
 Contributions from the United States National Herbarium, Washington, 8°.
 Journal of Mycology, Columbus, Ohio, 8°.
 Missouri Botanical Garden Reports, St. Louis, 8°.
 Annals of Botany (Balfour), London, 8°.
 Annals of the Royal Botanic Garden, Calcutta, 4°.
 Curtis's Botanical Magazine, London, 8°.
 Gardeners' Chronicle. *See* Supplemental list, Bureau of Agriculture.
 Hooker's Icones plantarum, London, 8°.
 Index Kewensis plantarum phanerogamarum, 1. and 2. supplements, Brussels and Oxford, 4°.
 Indian Forester. *See* Supplemental list, Bureau of Agriculture and Bureau of Forestry.
 Journal of Botany, British and Foreign, London, 8°.
 Journal of the Linnean Society, Botany, London, 8°.
 Kew Bulletin of Miscellaneous Information, London, 8°.
 Records of the Botanical Survey of India, Calcutta, 8°.
 Transactions of the Linnean Society, 2. series, Botany, London, 4°.

- Allgemeine botanische Zeitschrift, Karlsruhe, 8°.
 Beihefte zum botanischen Centralblatt, Jena, 8°.
 Berichte der deutschen botanischen Gesellschaft, Berlin, 8°.
 Botanische Jahrbücher für Systematik, Pflanzengeschichte und
 Pflanzengeographie (Engler), Leipzig, 8°.
 Botanische Zeitung, Leipzig, 4°.
 Botanisches Centralblatt, Leiden, 8°.
 Flora, oder Allgemeine botanische Zeitung, Marburg, 8°.
 Genera siphonogamarum (De Dalla Torre et Harms), Leipzig, 4°.
 Hedwigia. Organ für Kryptogamenkunde und Phytopathologie,
 Dresden, 8°.
 Jahrbücher für wissenschaftliche Botanik (Pringsheim), Leipzig,
 8°.
 Just's Botanischer Jahresbericht, Leipzig, 8°.
 Notizblatt des königl. botanischen Gartens und Museums zu Berlin,
 Leipzig, 8°.
 Oesterreichische botanische Zeitschrift, Wien, 8°.
 Pflanzenreich (Engler), Leipzig, 8°.
 Zeitschrift für Pflanzenkrankheiten, Stuttgart, 8°.
 Annales du Jardin botanique de Buitenzorg, Leide, 8°.
 Annales des sciences naturelles, Botanique, Paris, 8°.
 Bulletin de l'Herbier Boissier, Genève, 8°.
 Journal de botanique, Paris, 8°.
 Revue mycologique, Toulouse, 8°.
 Malpighia, Genova, 8°.
 Mededeelingen uit 'sLands Plantentuin, Batavia, 8°.

ZOOLOGY.

GENERAL.

- Zoological Record, London, 8°.
 Zeitschrift für wissenschaftliche Zoologie, Leipzig, 8°.
 Zoologischer Anzeiger, Leipzig, 8°.
 Archives de parasitologie (Blanchard), Paris, 8°.
 Annotationes zoologicae Japonenses (Nihon Dobutsugaku Iho),
 Tokyo, 8°.

ENTOMOLOGY.

- Canadian Entomologist, London, Ontario, 8°.
 Entomological News, Philadelphia, 8°.
 Entomologist, London, 8°.

- Entomologist's Monthly Magazine, London, 8°.
 Berliner entomologische Zeitschrift, Berlin, 8°.
 Entomologische Zeitschrift, Guben, 4°.
 Exotische Käfer (Heyne), Leipzig, 4°.
 Exotische Schmetterlinge (Hübner), Leipzig, 4°.
 Stettiner entomologische Zeitung, Stettin, 8°.
 Wiener entomologische Zeitung, Wien, 8°.
 Zeitschrift für Entomologie, Berlin, 8°.
 Zeitschrift für Hymenopterologie und Dipterologie, Teschendorf
 i. Mecklenburg, 8°.
 Genera insectorum (Wytsman), Bruxelles, 4°.
 Revue d'entomologie, Caen, 8°.
 Entomologisk Tidskrift, Stockholm, 8°.
 Proceedings of the Entomological Society of Washington, 8°.
 Transactions of the American Entomological Society, Philadelphia,
 4°.
 Transactions of the Entomological Society of London, 8°.
 Annales de la Société entomologique de Belgique, Bruxelles, 8°.
 Annales de la Société entomologique de France, Paris, 8°.
 Bulletin de la Société entomologique, Paris, 8°.

ORNITHOLOGY.

- Bulletin of the British Ornithologist's Club, London, 8°.
 Ibis, a Quarterly Journal of Ornithology, London, 8°.

MEDICINE.

INDEXES, BIBLIOGRAPHIES, REVIEWS, ETC.

- Index Catalogue of the Library of the Surgeon-General's Office,
 United States Army, 2. series, Washington, 8°.
 Index Medicus, 2. series, Washington, 8°.
 Medical Review of Reviews, New York and London, 8°.
 Medical Review, London, 8°.
 Centralblatt für Bakteriologie, Parasitenkunde und Infektions-
 krankheiten, part 1, Referate, Jena, 8°.
 Centralblatt für innere Medizin, Leipzig, 8°.
 Centralblatt für die medicinischen Wissenschaften, Berlin, 8°.
 Jahresbericht der Pharmacie, Göttingen, 8°.
 Jahresbericht über die Fortschritte in der Lehre von den Gärungs-
 Organismen (Koch), Leipzig, 8°.

- Jahresbericht über die Fortschritte in der Lehre von den pathogenen Mikroorganismen (Baumgarten), Leipzig, 8°.
- Jahresbericht über die Fortschritte der Physiologie (Hermann), Stuttgart, 8°.
- Jahresbericht über die Fortschritte und Leistungen auf dem Gebiete der Hygiene (Uffelmann), Braunschweig, 8°.
- Jahresbericht über die Leistungen und Fortschritte in der gesammten Medicin (Waldeyer und Posner), Berlin, 8°. *Continuation of Virchow und Hirsch's Jahresbericht.*
- Schmidt's Jahrbücher der in- und ausländischen gesammten Medicin, Leipzig, 4°.
- Bulletin de l'Institut Pasteur, Paris, 8°.

ANATOMY AND PHYSIOLOGY.

- Anatomische Hefte (Merkel und Bonnet. Beiträge und Referate zur Anatomie und Entwicklungsgeschichte, part 1), Wiesbaden, 8°.
- Anatomischer Anzeiger, Jena, 8°.
- Archiv für Anatomie und Physiologie (Anatomische Abtheilung = Archiv für Anatomie und Entwicklungsgeschichte; Physiologische Abtheilung = Archiv für Physiologie), Leipzig, 8°.
- Archiv für mikroskopische Anatomie und Entwicklungsgeschichte, Leipzig, 8°.
- Archives d'anatomie microscopique, Paris, 8°.
- Journal de l'anatomie et de la physiologie normales et pathologiques, Paris, 8°.
- American Journal of Physiology, Boston, 8°.
- Journal de physiologie et pathologie générale, Paris, 8°.
- Hoppe-Seyler's Zeitschrift für physiologische Chemie, Strassburg, 8°.

HYGIENE AND SANITATION.

- Bulletins of the Hygienic Laboratory, Public Health and Marine-Hospital Service of the United States, Washington, 8°.
- Public Health Reports (United States Public Health and Marine-Hospital Service), Washington, 8°.
- Journal of Hygiene, Cambridge, 8°.
- Arbeiten aus dem kaiserlichen Gesundheitsamte, Berlin, 8°.
- Archiv für Hygiene, München und Berlin, 8°.
- Archiv für Schiffs- und Tropen-Hygiene (Mense), Leipzig, 8°.

- Hygienische Rundschau, Berlin, 8°.
 Journal d'hygiène, Paris, 4°.
 Annali d'igiene sperimentale, Milano-Torino-Roma-Napoli, 8°.

GENERAL MEDICINE.

- American Journal of the Medical Sciences, Philadelphia and New York, 8°.
 American Medicine, Philadelphia, 4°.
 Boston Medical and Surgical Journal, Boston, 4°.
 Bulletin of the Johns Hopkins Hospital, Baltimore, 4°.
 International Clinics, Philadelphia, 8°.
 Johns Hopkins Hospital Reports, Baltimore, 8°.
 Journal of the American Medical Association, Chicago, 4°.
 Medical News, New York, 8°.
 Medical Record, New York, 4°.
 Montreal Medical Journal, Montreal, 8°.
 New York Medical Journal and Philadelphia Medical Journal, New York, 4°.
 Northwest Medicine, Seattle, Wash., 8°.
 Nothnagel's Encyclopedia of Practical Medicine, Philadelphia and London, 8°.
 Pennsylvania Medical Journal, Athens, Pa., 8°.
 Progressive Medicine (Hare), Philadelphia and New York, 8°.
 Scientific Memoirs by Officers of the Medical and Sanitary Departments of the Government of India, Calcutta, 4°.
 Univ. of Penna. Medical Bulletin, Philadelphia, 4°.
 British Medical Journal (Association Medical Journal), London, 8°.
 Indian Lancet, Calcutta, 4°.
 Indian Medical Gazette, Calcutta, 4°.
 Journal of Tropical Medicine, London, 8°.
 Lancet, London, 4°.
 Archiv für Verdauungskrankheiten, Berlin, 8°.
 Berliner klinische Wochenschrift, Berlin, 4°.
 Deutsche medicinische Wochenschrift, Berlin, 4°.
 Deutsches Archiv für klinische Medicin, Leipzig, 8°.
 Graefe's Archiv für Ophthalmologie, Leipzig, 8°.
 Klinisches Jahrbuch, Jena, 8°.
 Münchener medicinische Wochenschrift, München, 4°.

- Prager medicinische Wochenschrift, Prag, f.^o
 St. Petersburger medicinische Wochenschrift, St. Petersburg, 4.^o.
 Wiener klinische Wochenschrift, Wien, 4.^o.
 Wiener medicinische Wochenschrift, Wien, 4.^o.
 Zeitschrift für klinische Medizin, Berlin, 8.^o.
 Archives générales de médecine, Paris, 8.^o.
 Archives de médecine navale, Paris, 8.^o.
 Archives médicales de Toulouse, Toulouse et Paris, 8.^o.
 Gazette des hôpitaux, Paris, 4.^o.
 Gazette hebdomadaire des sciences médicales de Bordeaux, 4.^o.
 Gazette médicale de Paris, 4.^o.
 Journal de médecine de Paris, 4.^o.
 Presse médicale, Paris, f.^o.
 Progrès médical, Paris, 4.^o.
 Revue de médecine, Paris, 8.^o.
 Semaine médicale, Paris, 4.^o.
 Archivio per le scienze mediche, Torino, 8.^o.
 Bulletino delle scienze mediche, Bologna, 8.^o.
 Gazzetta medica di Roma, 8.^o.
 Russkii Vrach, St. Petersburg, 4.^o.
 Mittheilungen aus der medicinischen Facultät der kaiserlich-japanischen Universität zu Tokio (Teikoku Daigaku Kiyo Iken), Tokyo, 8.^o.

PHARMACY AND THERAPEUTICS.

- Therapeutic Gazette, Detroit, 8.^o.
 Archiv der Pharmacie, Berlin, 8.^o.

PATHOLOGY AND BACTERIOLOGY.

- Journal of Cutaneous Diseases including Syphilis, New York, 8.^o.
 Journal of Experimental Medicine, Baltimore, 8.^o.
 Journal of Medical Research, Boston, 8.^o.
 Studies from the Rockefeller Institute for Medical Research, New York, 8.^o.
 Atlas of Illustrations of Clinical Medicine, Surgery and Pathology (New Sydenham Society), London, 4.^o.
 Journal of Pathology and Bacteriology, Edinburgh and London, 8.^o.
 Archiv für Dermatologie und Syphilis, Wien und Leipzig, 8.^o.
 Archiv für experimentelle Pathologie und Pharmakologie, Leipzig, 8.^o.

- Beiträge zur pathologischen Anatomie und zur allgemeinen Pathologie (Ziegler), Jena, 8°.
- Centralblatt für allgemeine Pathologie und pathologische Anatomie (Ziegler), Jena, 8°.
- Ergebnisse der allgemeinen Pathologie (Lubarsch-Ostertag), Wiesbaden, 8°.
- Monatshefte für praktische Dermatologie (Unna und Taenzer), Hamburg, 8°.
- Virchow's Archiv für pathologischen Anatomie und Physiologie und für klinische Medicin, Berlin, 8°.
- Archives de médecine expérimentale et d'anatomie pathologique, Paris, 8°.
- Sperimentale = Archivio di biologia normale e patologica, Firenze, 8°.
- Journal of Infectious Diseases, Chicago, 8°.
- Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten, part 1, Originale, part 2, Jena, 8°.
- Zeitschrift für Hygiene und Infektionskrankheiten (Koch und Flügge), Leipzig, 8°.
- Annales de l'Institut Pasteur, Paris, 8°.
- Journal of Bacteriology (Saikingaku Zasshi), Tokyo, 8°.

SURGERY AND GYNECOLOGY.

- Archiv für klinische Chirurgie (Langenbeck), Berlin, 8°.
- Centralblatt für Gynäkologie, Leipzig, 8°.

DENTISTRY.

- Dental Cosmos, Philadelphia, 8°.
- Dental Era, St. Louis, 8°.
- Dental Review, Chicago, 8°.
- International Dental Journal, Philadelphia, 8°.
- Items of Interest, New York, 8°.
- Pacific Dental Gazette, San Francisco, 8°.
- British Journal of Dental Science, London, 8°.
- Quarterly Circular, London, 8°.
- Correspondenz-Blatt für Zahnärzte, Berlin, 8°.
- Progrès dentaire, Paris, 8°.
- Stomatologiai Közlöny, Budapest, 8°.

COMPARATIVE AND VETERINARY MEDICINE.

- American Veterinary Review, New York, 8°.
Journal of Comparative Pathology and Therapeutics, Edinburgh and London, 8°.
Archiv für wissenschaftliche und praktische Thierheilkunde, Berlin, 8°.
Berliner tierärztliche Wochenschrift, Berlin, 4°.
Deutsche tierärztliche Wochenschrift, Hannover, 4°.
Oesterreiche Monatschrift für Tierheilkunde, Wien, 8°.
Schweizer-Archiv für Tierheilkunde, Zürich, 8°.
Tierärztliche Rundschau, Friedenau-Berlin, 4°.
Tierärztliches Centralblatt, Wien, 8°.
Zeitschrift für Thiermedizin, Jena, 8°.
Zeitschrift für Veterinärkunde, Berlin, 8°.
Journal de médecine vétérinaire et de zootechnie, Lyon, 8°.
Recueil de médecine vétérinaire, Paris, 8°.
Giornale della reale Società ed Accademia veterinaria italiana, Torino, 8°.

PROCEEDINGS OF SOCIETIES.

- Bulletin de l'Académie de médecine, Paris, 8°.

MISCELLANEOUS.

LIBRARY SCIENCE.

- Library Journal, New York, 8°.
Medical Library and Historical Journal, Brooklyn, N. Y., 8°.
Public Libraries, Chicago, 8°.

ENGINEERING.

- Engineering and Mining Journal, New York, 4°.

AGRICULTURE.

- Experiment Station Record (United States Department of Agriculture), Washington, 8°.
India Rubber World, New York, 4°.

PHOTOGRAPHY.

- American Annual of Photography and Photographic Times-Bulletin Almanac, New York, 8°.

Photographic Times-Bulletin, New York, 8°.

St. Louis and Canadian Photographer, St. Louis, 8°.

Photographische Mitteilungen, Berlin, 8°.

LIST OF SETS OF PERIODICALS ARRANGED ALPHABETICALLY AND GIVING INCLUSIVE YEARS AND VOLUMES.

Adansonia (Baillon), vols. 1-12, 1860-1879, Paris, 8°.

Allgemeine botanische Zeitschrift, vol. 10, 1904, Karlsruhe, 8°.

Allgemeine botanische Zeitung. *See* Flora.

American Annual of Photography and Photographic Times-Bulletin Almanac, 1902-1903, New York, 8°.

American Chemical Journal, vols. 1-32, 1879-1904, Baltimore, 8°.

American Journal of the Medical Sciences, vols. 1-26, 1827-1840; new series, vols. 1-128, 1841-1904, Philadelphia and New York, 8°.

American Journal of Physiology, vols. 1-10, 1898-1904, Boston, 8°.

American Journal of Sciences (Silliman), vols. 161-168, 1901-1904, New Haven, 8°.

American Medicine, vols. 1-8, 1901-1904, Philadelphia, 4°.

American Veterinary Review, vol. 28, 1904, New York, 8°.

Anatomische Hefte (Merkel und Bonnet. Beiträge und Referate zur Anatomie und Entwicklungsgeschichte, part 1), vols. 20-26, 1903-1904, Wiesbaden, 8°.

Anatomischer Anzeiger, vols. 1-25, 1886-1904; Ergänzungshefte, 3-18, 21-23; Litteratur, 1897-1899, Jena, 8°.

Annalen der Chemie. *See* Liebig's Annalen der Chemie.

Annalen der Physik, vols. 1-15, 1900-1904, Leipzig, 8°.

Annalen der Physik und Chemie, vols. 1-160, 1824-1877; new series, vols. 1-69, 1877-1899; Beiblätter, vols. 1-26, 1877-1902; Ergänzungsbände, 1-8, 1842-1878; Jubelband, 1874; indexes, 6 vols., Leipzig, 8°.

Annales de chimie et de physique, 1. series, vols. 1-96, 1789-1815; 2. series, vols. 1-75, 1816-1840; 3. series, vols. 1-69, 1841-1863; 4. series, vols. 1-30, 1864-1873; 5. series, vols. 1-30, 1874-1883; 6. series, vols. 1-30, 1884-1893; 7. series, vols. 1-30, 1894-1903; 8. series, vols. 1-3, 1904; 11 index volumes, Paris, 8°.

- Annales de l'Institut Pasteur, vols. 1-18, 1887-1904, Paris, 8°.
- Annales de la Société entomologique de Belgique, vols. 1-48, 1857-1904, Bruxelles, 8°.
- Annales de la Société entomologique de France, 1. series, vols. 1-11, 1832-1842; 2. series, vols. 1-10, 1843-1852; 3. series, vols. 1-8, 1853-1860; 4. series, vols. 1-10 and supplement to vol. 10, 1861-1870; 5. series, vols. 1-10, 1871-1880; 6. series, vols. 1-10, 1881-1890; vols. 60-72, 1891-1903, Paris, 8°.
- Annales des sciences naturelles, Botanique, 8. series, vols. 17-19, 1903-1904, Paris, 8°.
- Annales du Jardin Botanique de Buitenzorg, vols. 1-15 and 1. supplement, 1876-1898; 2. series, vol. 4, 1904, Leide, 8°.
- Annali d'igiene sperimentale, new series, vols. 11-14, 1901-1904, Milano-Torino-Roma-Napoli, 8°.
- Annals of Botany (Balfour), vols. 1-18 and index, 1887-1904, London, 8°.
- Annals of the Royal Botanic Garden, Calcutta, vols. 1-19, 1887-1901, Calcutta, 4°.
- Annotationes zoologicae Japonenses (Nihon Dobutsugaku Iho), published by the Tokyo Zoological Society, vols. 1-5, 1897-1904, Tokyo, 8°.
- Arbeiten aus dem kaiserlichen Gesundheitsamte, vol. 16, 1899; vols. 20-21, 1904, Berlin, 8°.
- Archiv der Pharmacie, vols. 239-242, 1901-1904, Berlin, 8°.
- Archiv für Anatomie und Entwicklungsgeschichte (Anatomische Abtheilung of Archiv für Anatomie und Physiologie), 28 vols., 1877-1904, Leipzig, 8°.
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Several lists might well have been subdivided more closely, but the comparatively small number of books in such lists, the limited time available for the preparation of this catalogue, and the fact that the books are used to a large extent by the same people have led to their being placed under one alphabet.

Some books used extensively by workers in two divisions of scientific work—*e. g.*, chemistry and medicine—have been included in both lists. This is true also of a few of the reference books which belong strictly to one branch of science but which are referred to so frequently that they have been placed on reference-book shelves in the library and included here under that division as well as in the subject list to which they belong.

The number of pages in books and pamphlets has been given only in the entomological works, where the large number of short monographs and reprints has made this seem advisable.

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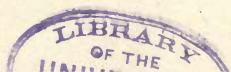
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Botany of cotton by Walter H. Evans.

Chemistry of cotton by J. B. McBride and W. H. Beal.

Climatology and soils by Milton Whitney.

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 - Vol. 1. Public laws passed by the Philippine Commission during the period from September 1, 1900, to August 31, 1902, comprising the Acts nos. 1 to 449, inclusive, with amendments indicated down to and including Act no. 816 passed July 31, 1903, and an appendix containing the treaty of Paris, the Acts of Congress of March 8, 1902, April 29, 1902, July 1, 1902, and General Orders, no. 68, series of 1899, and nos. 58 and 70, series of 1900, 1903.
 - Vol. 2. Public laws passed by the Philippine Commission during the period of September 1, 1902, to August 31, 1903, comprising Acts nos. 450 to 862, inclusive, with amendments indicated down to and including Act no. 1050 passed February 12, 1904, and an appendix containing the Proclamation by the Military Governor, August 14, 1898, continuing in force the Spanish municipal law, the Amnesty Proclamation of July 4, 1902, the Protocol of Agreement extending the time fixed by the treaty of Paris for the registration of Spanish subjects in the Philippine Islands, the Acts of Congress of January 30, February 9, March 2, March 3, 1903, an extract from the Sundry Civil Bill of March 3, 1903, and an alphabetical list of the Executive orders and proclamations issued by the Civil Governor since the establishment of the Civil Government in the Islands, 1904.
- Leyes públicas aprobadas por la Comisión en Filipinas, con las reformas señaladas, vols. 1-2 (Translation of public laws passed by the Philippine Commission with amendments indicated).
- Public laws and resolutions passed by the Philippine Commission, vols. 13-16, 1903-1904.
 - Vol. 13. Public laws and resolutions passed by the Philippine Commission during the quarter ending November 30, 1903, Acts nos. 863-1016, 1903.
 - Vol. 14. Public laws and resolutions passed by the Philippine Commission during the quarter ending February 29, 1904, Acts nos. 1017-1071, 1904.

- Vol. 15. Public laws and resolutions passed by the Philippine Commission during the quarter ending May 31, 1904, Acts nos. 1072-1170, 1904.
- Vol. 16. Public laws and resolutions passed by the Philippine Commission during the quarter ending August 3, 1904, Acts nos. 1171-1225, 1904.
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- Bulletin 1. Population of the Philippines by islands, provinces, municipalities and barrios, taken in the year 1903.
- Bulletin 2. The climate of the Philippines by Rev. José Algué.
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- Yearbook of the United States Department of Agriculture, 1894-1903.

**LIST OF COMPLETE SETS OF PERIODICALS ORDERED
BUT NOT AS YET RECEIVED.**

- Allgemeines Journal der Chemie (Scherer), 1798-1803.
- Annali d'igiene sperimentale, to 1901.
- Arbeiten aus dem kaiserlichen Gesundheitsamte, vols. 1-19.
- Arbeiten der botanischen Institute zu Würzburg, 3 vols. 1874-1888.
- Arbeiten des pharmacologischen Institut zu Dorpat, to 1902.
- Archiv der Pharmacie, vols. 1-238.
- Archiv für Anatomie und Physiologie, 1825-1832.
- Archiv für Dermatologie und Syphilis, vols. 1-67.
- Archiv für experimentelle Pathologie und Pharmakologie, vols. 1-48.
- Archiv für Hygiene, vols. 1-39.
- Archiv für klinische Chirurgie (Langenbeck), vols. 1-68.
- Archiv für Verdauungskrankheiten vols. 1-8.
- Archives d'anatomie microscopique, vols. 1-5.
- Archivio per le scienze mediche, Torino, vols. 1-24.
- Arkiv för Botanik, from beginning.
- Berichte aus dem physiologischen Laboratorium und der Versuchsanstalt des landwirtschaftlichen Instituts der Universität Halle, to 1903.

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- Berichte der schweizerischen botanischen Gesellschaft, 1891-1901.
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all published.
Centralblatt für Agrikulturchemie (Biedermanns), vols. 1-31.
Centralblatt für Gynäkologie, vols. 1-26.
Centralblatt für Nahrungs- und Genussmittel-Chemie, complete.
Chemische Industrie (Jacobson), vols. 1-23.
Comptes rendus . . . de la Société de biologie, vols. 1-52.
Deutsche medicinische Wochenschrift, vols. 1-26.
Diagnoses phanerogamarum, subscription beginning with first
number.
Historische Studien aus dem pharmakologischen Institut der kaiser-
lichen Universität Dorpat, to 1903.
Hooker's Journal of Botany and Kew Garden Miscellany, 1849-
1857.
India Rubber World, 1901-1902.
Indian Medical Gazette, vols. 1-37.
Jahresbericht der Pharmacie, vols. 1-33.
Jahres-Bericht über die Leistungen der chemischen Technologie
(Fischer), vols. 1-47.
Journal of Applied Microscopy and Laboratory Methods, vols. 1-5.
Journal of the Asiatic Society of Bengal, Natural History series,
1865-1903.
Journal of Botany, British and Foreign, vols. 1-40.
Journal für Chemie, Physik und Mineralogie (von Gehlen), 1807-
1809.
Journal of Comparative Pathology and Therapeutics, vols. 1-15.
Journal of Tropical Medicine, vols. 1-5.
Just's Botanischer Jahresbericht, vols. 1-29, 1874-1903.
London Journal of Botany (Hooker), 1842-1848.
Memoirs from the Biological Laboratory of the Johns Hopkins
University, vol. 1.
Memiors of the Liverpool School of Tropical Medicine, complete.
Mittheilungen aus der medicinischen Facultät der kaiserlich-japan-
ischen Universität zu Tokio, Tokyo (Teikoku Daigaku Chikuyo
Iken), vols. 1-5.
Münchener medicinische Wochenschrift, vols. 1-47.
Neues Journal für Chemie (von Gehlen), 1803-1806.
Petites nouvelles entomologiques, 1869-1879.

Prager medicinische Wochenschrift, vols. 1-15.

Repertorium der analytischen Chemie (*Analytischer Chemiker Verein*), to 1887.

Semaine médicale, vols. 1-22.

St. Louis and Canadian Photographer, vol. 26, 1902.

Studies from the Department of Pathology of the College of Physicians and Surgeons, Columbia University, complete.

Thompson-Yates Laboratory Reports, complete.

Univ. of Penna. Medical Bulletin, vols. 1-15.

Untersuchungen über die Gesamtgebiete der Mykologie, 1872-1889.

Wiener medicinische Wochenschrift, vols. 1-52.

Zeitschrift für angewandte Mikroskopie, vols. 1-6.

Zeitschrift für Nahrungsmittel-Untersuchung, Hygiene und Warenkunde, complete.

Zeitschrift für öffentliche Chemie, vols. 1-6.

Zeitschrift für Pflanzenkrankheiten, vols. 1-12.

In addition to the above periodicals, books to the number of 112 are still undelivered, distributed among the various divisions of the laboratory as follows: (1) Entomological works, consisting chiefly of articles published in scientific journals of which reprints have not as yet been secured, 52 volumes; (2) works on chemistry and chemical technology, 18 volumes; (3) botanical works, 29 volumes; (4) works in medicine and allied sciences, 12 volumes, and (5) photographic publications, 1 volume.

Some of these, particularly old editions, have not yet been found in the market; others are waiting for new editions to appear, and a small number are yet in manuscript, although announced when ordered.

SUPPLEMENTAL LIST OF BOOKS RECEIVED FROM VARIOUS BUREAUS OF THE DEPARTMENT OF THE INTERIOR.

The following supplemental lists include books transferred from various Bureaus of the Department of the Interior after the plan for the catalogue of the books previously in the library of the Bureau of Government Laboratories had been completed. They were added thus in supplemental lists (1) for lack of time in which to work out the classification scheme carefully for the whole list of books, and (2) because it was thought there was an advantage in showing what books were in the libraries of the various Bureaus before the transfer. It is believed that the table of contents and index are worked out sufficiently comprehensively to obviate especial difficulty from books being included in different lists.

In the case of some important botanical literature cross references are made from supplemental lists to lists of books in the library before transfer. This has not been carried further for lack of time.

Among the books of The Ethnological Survey were found many short monographs and reprints from scientific publications. For this reason the number of pages have been given for this list alone.

The use of the asterisk (*) before titles in the "Supplemental list" indicates that these books have been returned on memorandum receipt to the Bureaus from which they were received by transfer.

BUREAU OF PUBLIC HEALTH.

REFERENCE BOOKS.

*Gould, George M. Illustrated dictionary of medicine, biology, and allied sciences, 5. edition, 1903, 2 copies.

Polk. Medical and surgical register of the United States and Canada, 6. edition, 1900.

ANATOMY AND PHYSIOLOGY.

*Gray, Henry. Anatomy, descriptive and surgical, from 13. English edition, 1897.

Gray, Henry. *See above*, revised American from 15. English edition, 1901.

*Landois, L. and Stirling, William. Text-book of human physiology including histology and microscopical anatomy, 3. American edition (translation from 6. German edition by William Stirling), 1889.

*Minot, Charles Sedgwick. Human embryology, 1897.

PHARMACY AND CHEMISTRY.

*Fownes. Manual of chemistry, theoretical and practical, new American from 12. English edition, 1885.

Novy, Frederick G. Laboratory work in physiological chemistry, 2. edition, 1898.

Remington, Joseph P. Practice of pharmacy, 3. edition, 1894.

DIAGNOSIS, THERAPEUTICS, AND SURGERY.

*Da Costa, J. M. Medical diagnosis, 9. edition, 1901.

*Dennis, Frederic S., editor. System of surgery, vols. 1-4, 1895-1896 (collaborators: Hermann Biggs, John S. Billings, Phineas S. Conner, William T. Councilman, A. G. Gerster, Charles B. Nancrede, Stephen Warren Smith, J. Collins, William H. Welch, and Horatio C. Wood).

- ***Hampton, Isabel Adams.** Nursing: its principles and practice, revised edition, 1903.
- ***Hare, Hobart Amory.** Practical diagnosis, 5. edition, 1902.
- ***Hare, Hobart Amory.** Text-book of practical therapeutics, 9. edition, 1902.
- Hofmann, K. B. and Ultzmann, R.** Analysis of the urine with special reference to the diseases of the genito-urinary organs, 3. edition (translation by T. Barton Brune and H. Holbrook Curtis), 1889.
- ***Kelley, Howard A.** Operative gynecology, vols. 1-2, 1901, 2 copies.
- ***Lusk, William Thompson.** Science and art of midwifery, new edition, 1900.
- ***Osler, William.** Principles and practice of medicine, 5. edition, 1903.
- ***Starr, Louis and Wescott, Thompson S.,** editors. American text-book of the diseases of children including special chapters on essential surgical subjects, orthopedics, diseases of the eye, ear, nose and throat, diseases of the skin, and on the diet, hygiene and general management of children, 2. edition, 1900.
- ***Stedman, Thomas L.,** editor. Twentieth century practice: an international encyclopedia of modern medical science, vols. 1-20, 1895-1900.
- Vol. 1. Diseases of the uropoietic system, 1895.
- Vol. 2. Nutritive disorders, 1895.
- Vol. 3. Occupation diseases, drug-habits and poisons, 1895.
- Vol. 4. Diseases of the vascular system and thyroid gland, 1895.
- Vol. 5. Diseases of the skin, 1896.
- Vol. 6. Diseases of the respiratory organs, 1896.
- Vol. 7. Respiratory organs and blood, functional sexual disorders, 1896.
- Vol. 8. Diseases of the digestive organs, 1896.
- Vol. 9. Diseases of the digestive organs, 1897.
- Vols. 10-11. Diseases of the nervous system, 1897.
- Vol. 12. Mental diseases, childhood and old age, 1897.
- Vols. 13-16. Infectious diseases, 1898.
- Vol. 17. Infectious diseases and malignant neoplasms, 1898.
- Vol. 18. Syphilis and leprosy, 1899.
- Vol. 19. Malaria and microorganisms, 1900.
- Vol. 20. Tuberculosis, yellow fever and miscellaneous, 1900.

- ***Sternberg, George M.** Immunity, protective inoculations in infectious diseases and serum-therapy, 1895.
- ***Stevenson, W. F.** Wounds in war: the mechanism of their production and their treatment, 1897.
- Thompson, W. Gilman.** Practical dietetics with special reference to diet in disease, 1901.
- ***Williams, William.** Principles and practice of veterinary surgery, new edition, 1894.

HYGIENE AND SANITATION.

- ***Folwell, A. Prescott.** Sewerage: the designing, construction and maintenance of sewerage systems, 4. edition, 1901.
- ***Gerhard, William Paul.** Guide to sanitary house-inspection, 3. edition, 1902.
- ***Gerhard, William Paul.** Recent practice in the sanitary drainage of buildings with memoranda on the cost of plumbing work, 2. edition, 1890.
- ***Hazen, Allen.** Filtration of public water supplies, 3. edition, 1901.
- Leeds, Albert R.** Report on the results of the chemical and microscopical examination of the water supply of Brooklyn, 1897.
- ***Mason, William P.** Water supply: considered principally from a sanitary standpoint, 2. edition, 1898.
- Moore, Charles, editor.** Purification of the Washington water supply: an inquiry held by direction of the United States Senate Committee on the District of Columbia, 1901.
- ***Munson, Edward L.** Theory and practice of military hygiene, 1901.
- ***Notter, J. Lane and Firth, R. H.** Hygiene, new edition, 1900.
- Stevenson, Thomas and Murphy, Shirley F.** Treatise on hygiene and public health, vols. 1-3, 1892-1894.
- Feasibility and propriety of filtering the water supply of Washington, D. C. (letter from Secretary of War transmitting copy of report of Chief of Engineers, U. S. A.), 1900.
- Public Health papers and reports presented at the annual meetings of the American Public Health Association for 1873-1875, 1877-1878, 1880-1898, vols. 1-2, 4, 6-24, 1875-1898, 2 copies each of vols. 23 and 24.

PATHOLOGY AND BACTERIOLOGY.

- Garrigues, Henry J.** Text-book of the diseases of women, 3. edition, 1900.
- ***Hemmeter, John C.** Diseases of the stomach; their special pathology, diagnosis and treatment, with sections on anatomy, physiology, chemical and microscopical examination of stomach contents, dietetics, surgery of the stomach, etc., 3. edition, 1902.
- Johnston, James C. and Swinburne, George Knowles.** Atlas of venereal and skin diseases, 2. edition, 1900.
- Klein, E.** Bacteria in Asiatic cholera, 1889.
- Montenegro, José Verdes.** Bubonic plague: its course and symptoms and means of prevention and treatment, 1900 (translation by W. Munro with appendix by author).
- Novy, Frederick G.** Laboratory work in bacteriology, 2. edition, 1899.
- ***Shakespeare, Edward O.** Report on cholera in Europe and India, 1890.
- ***Stelwagon, Henry W.** Treatise on the diseases of the skin, 2. edition, 1903.
- ***Sternberg, George M.** Text-book of bacteriology, 2. edition, 1901.
- Taylor, Robert W.** Practical treatise on genito-urinary and venereal diseases and syphilis, 2. edition, 1900.
- ***Thayer, William Sydney.** Lectures on the malarial fevers, 1900.
- White, J. William and Martin, Edward.** Genito-urinary surgery and venereal diseases, 4. edition, 1900.

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- ***Clark, T. M.** Building superintendence, new edition, 1903.
- *— Numerical list of Acts, lists of amended Acts, and index from volume 1 of the new edition of Public Laws (U. S. Philippine Commission), 1903.

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- ***Gould, George M.** Illustrated dictionary of medicine, biology and allied sciences, 5. edition, 1900.

- Gould, George M. Student's medical dictionary, 11. edition, 1903.
- *Rand-McNally. Dollar atlas of the world, historical, political and commercial, 1903.
- *Virchow, Rudolph. Post-mortem examinations with special reference to medico-legal practice, 3. American from 4. German edition, 1896 (translation by T. P. Smith).
- *Wood, George B. and Bache, Franklin. Dispensatory of the United States of America, 18. edition, 1899.
- *—Nomenclature of diseases, 3. edition, 1896 (by a joint committee appointed by the Royal College of Physicians of London).
- Pharmacopoeia of the United States of America, 7. decennial revision, 1890, 1893.

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- *Brubaker, Albert P. Compend of human physiology, 11. edition, 1903.
- *Gray, Henry. Anatomy, descriptive and surgical, revised American from 15. English edition, edited by T. Pickering Pick and Robert Howden, 1901.
- *Morris, Henry and Lond, M. B., editors. Human anatomy: a complete systematic treatise including a special section on surgical and topographical anatomy, 3. edition, 1903.

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- *Attfield, John. Chemistry: general, medical and pharmaceutical including the chemistry of the U. S. Pharmacopoeia, 16. edition, 1899.
- *Cabot, Richard C. Guide to the clinical examination of the blood for diagnostic purposes, 4. edition, 1901.
- *Da Costa, J. M. Medical diagnosis, 9. edition, 1901.
- *Da Costa, J. M. Modern surgery, general and operative, 4. edition, 1903.
- *Davis, Edward P. Treatise on obstetrics, 1896.
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- ***Hare, Hobart Amory.** Practical diagnosis, 4. edition, 1899.
- ***Hare, Hobart Amory.** Text-book of practical therapeutics, 9. edition, 1902.
- Jacobson, W. H. A.** Operations of surgery, 1895.
- Keen, William W. and White, J. William,** editors. American text-book of surgery, 3. edition, 1899 (collaborators: Phineas S. Conner, Frederic S. Dennis, Charles B. Nancrede, Roswell Park, Lewis S. Pilcher, Nicholas Senn, Francis J. Shepherd, Lewis A. Stimson, and J. Collins Warren).
- Kelly, Howard A.** Operative gynecology, vols. 1-2, 1900.
- Manson, Patrick.** Tropical diseases, 1899.
- ***Osler, William.** Principles and practice of medicine, 5. edition, 1903.
- Potter, Samuel O. L.** Handbook of materia medica, pharmacy and therapeutics, 7. edition, 1899.

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- ***Egbert, Seneca.** Manual of hygiene and sanitation, 3. edition, 1903.
- ***Luff, Arthur P. and Page, Frederic James M.** Manual of chemistry, inorganic and organic, 1901.
- ***Rosenau, M. J.** Disinfection and disinfectants, 1902.

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- ***Abbott, A. C.** Principles of bacteriology, 5. edition, 1899.
- ***Coplin, W. M.** Manual of pathology including bacteriology, the technic of postmortems, and methods of pathologic research, 3. edition, 1901.
- ***Mallory, Frank Burr and Wright, James Homer.** Pathological technique, 1897.
- ***Schweinitz, G. E. de.** Diseases of the eye, 4. edition, 1903.
- ***Shoemaker, John V.** Practical treatise on diseases of the skin, 3. edition, 1900.
- ***Stelwagon, Henry W.** Essentials of diseases of the skin including the syphilodermata arranged in the form of questions and answers prepared especially for students of medicine, 5. edition, 1903.

- ***Stelwagon, Henry W.** Treatise on diseases of the skin, 2. edition, 1903.
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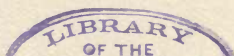
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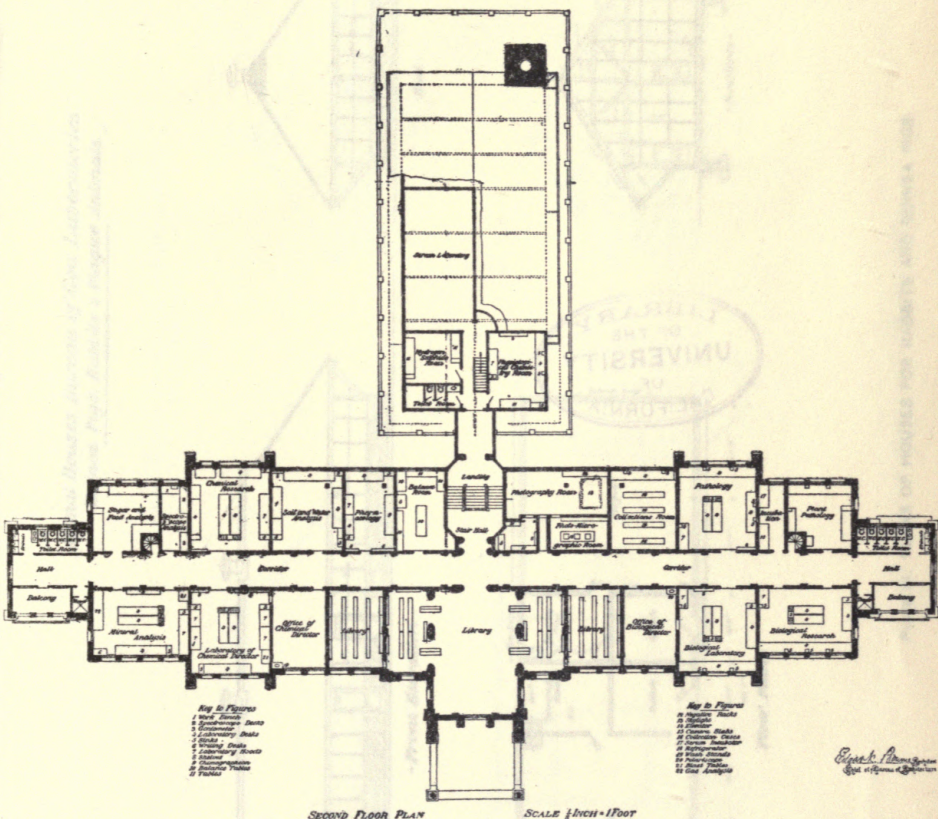
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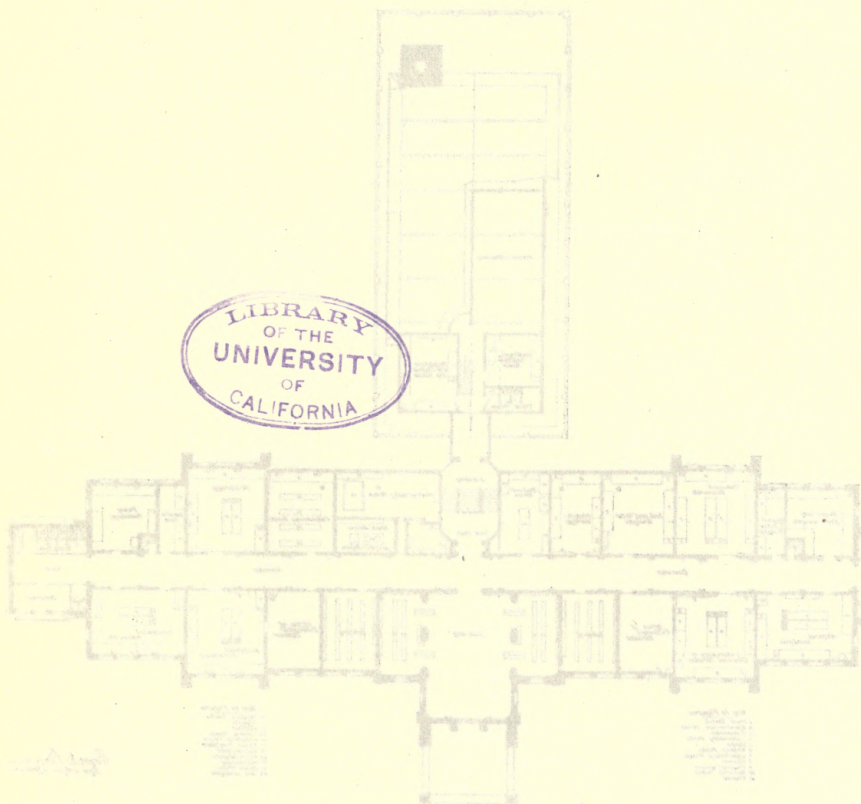
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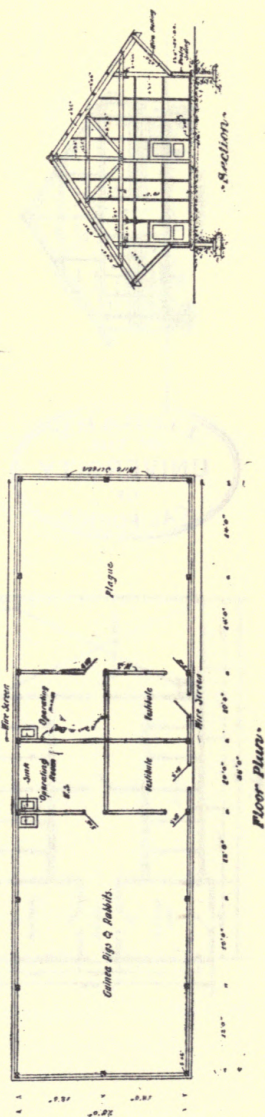
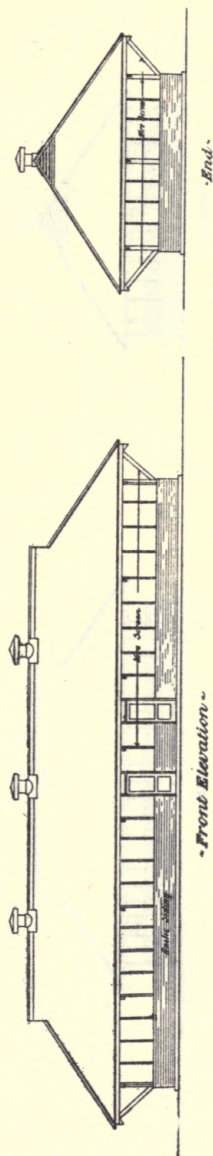
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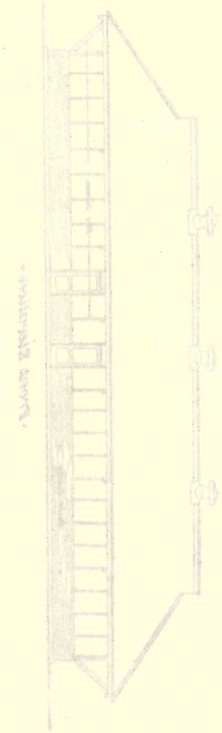
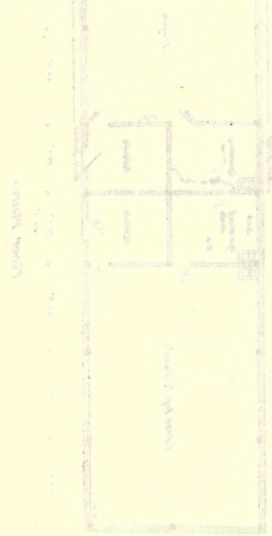
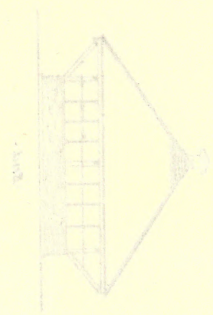
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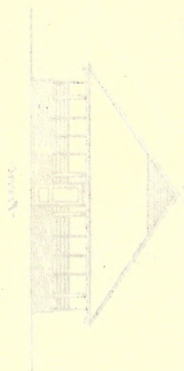
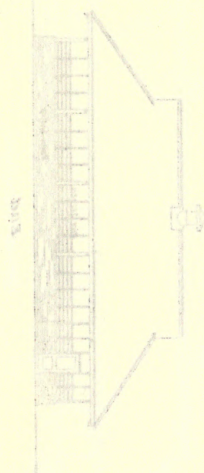
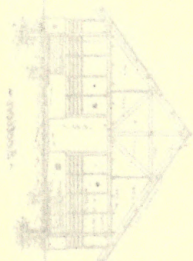
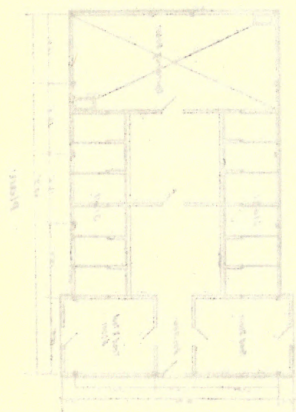
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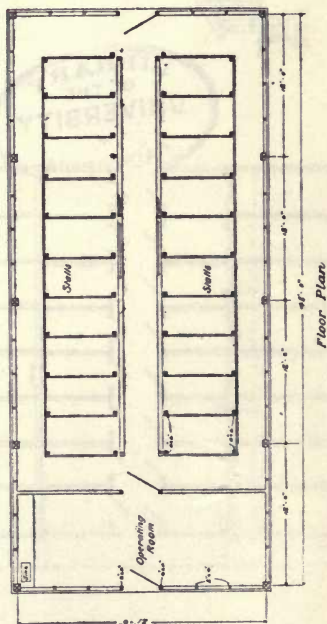
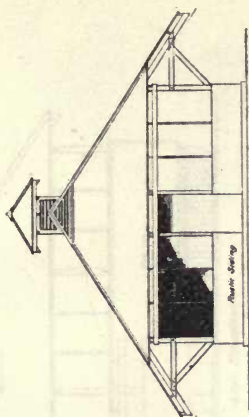
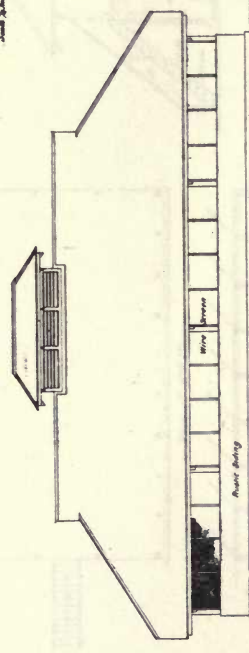
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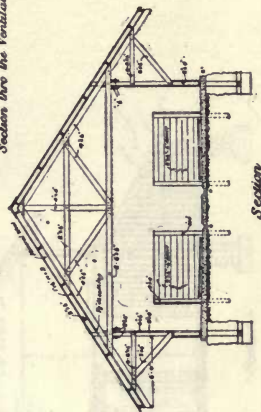


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Animal Houses Bureau of Gov. Laboratories
Vaccine Stable
Length 30' x 40' x 10'



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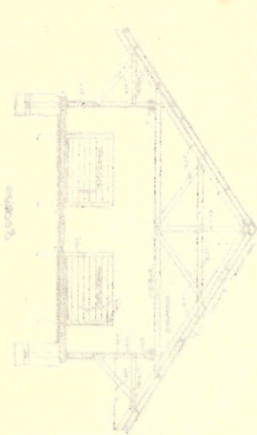


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PLATE V. PLANS OF STABLE FOR VACCINE CALVES.



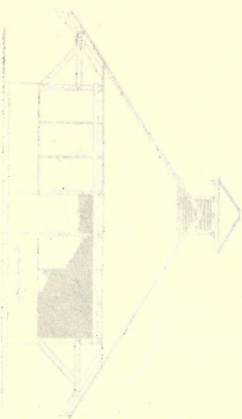
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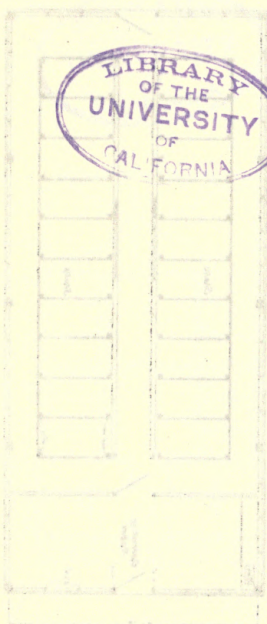


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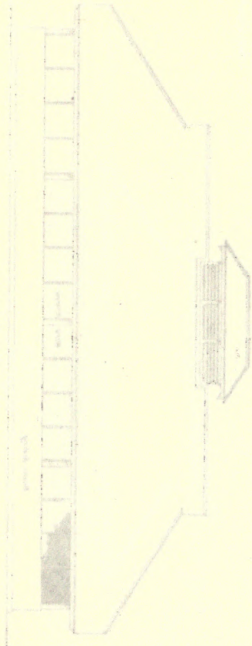
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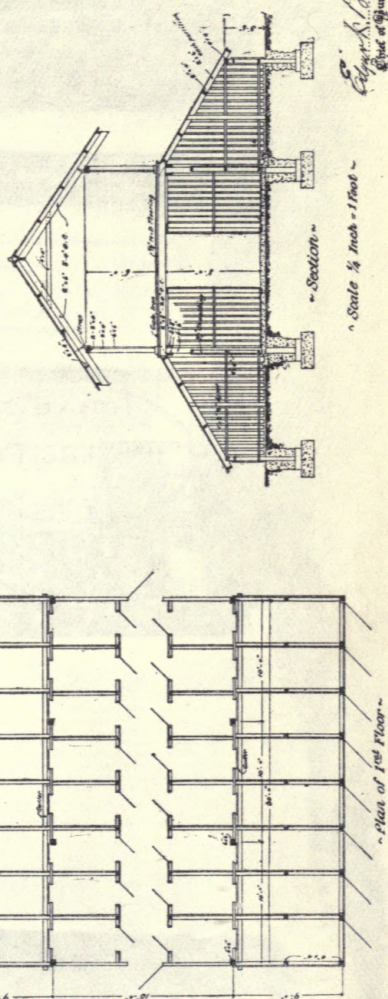
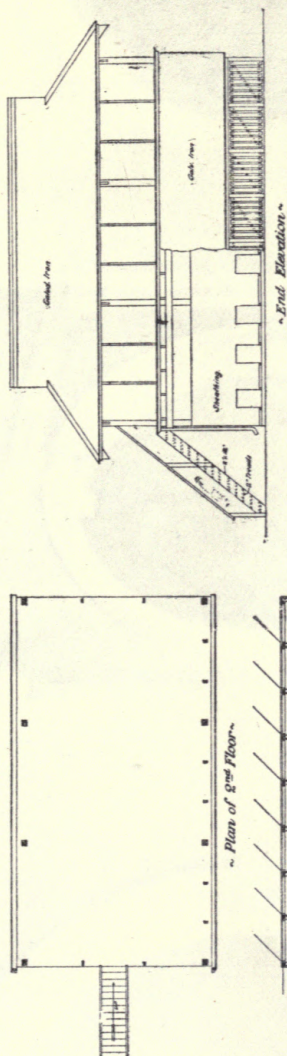
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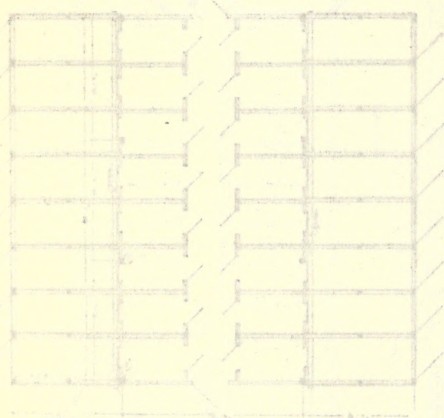
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PLATE VI. PLANS OF HOUSES FOR DOGS, GOATS, SHEEP, AND MONKEYS.

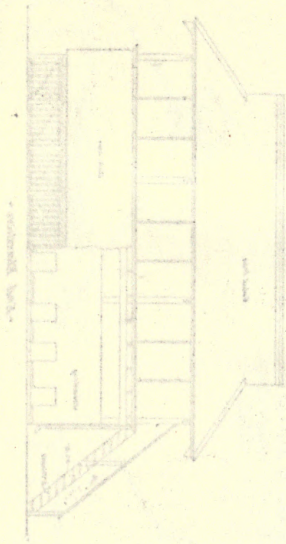
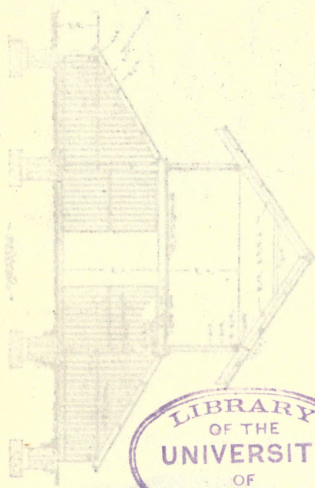
DETAILS OF HOUSES FOR COOL DOWLS SHELL AND AIRWAYS

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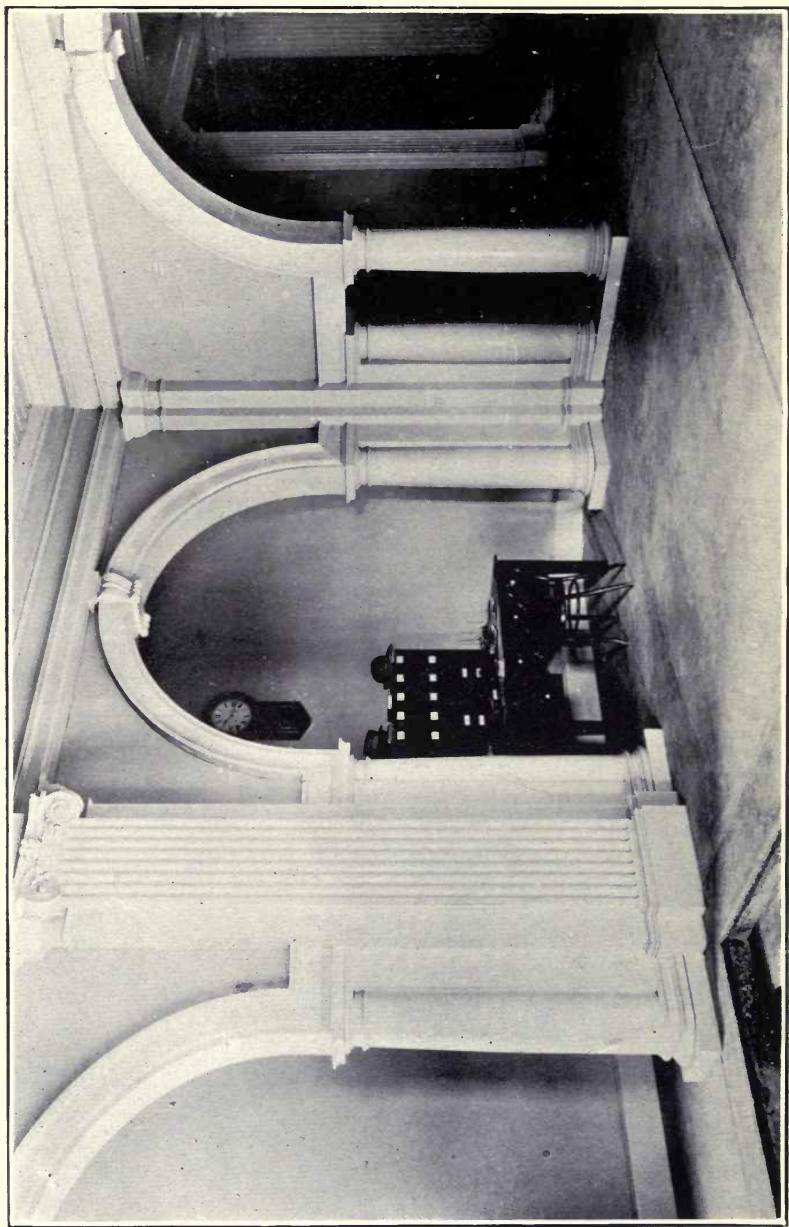


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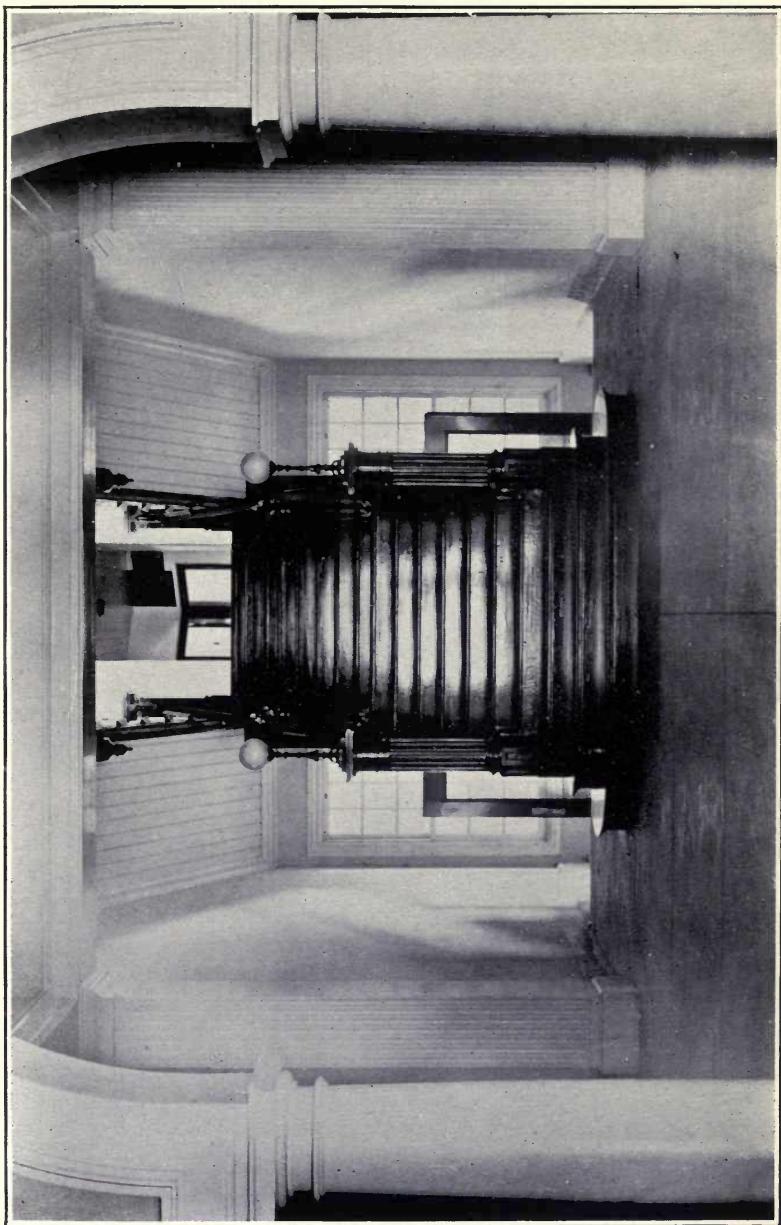


PLATE VIII. FRONT STAIRWAY.





PLATE IX. REAR VIEW SHOWING SERUM LABORATORY POWER HOUSE AND STACK.



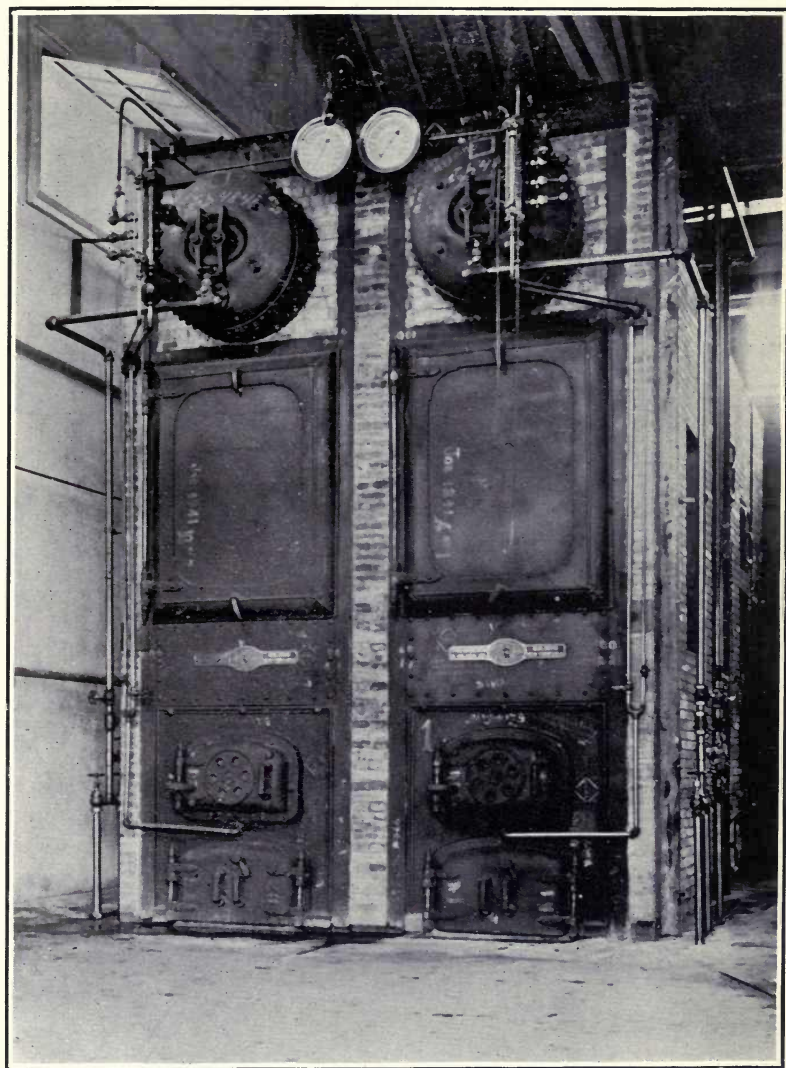


PLATE X. BABCOCK AND WILCOX BOILERS.

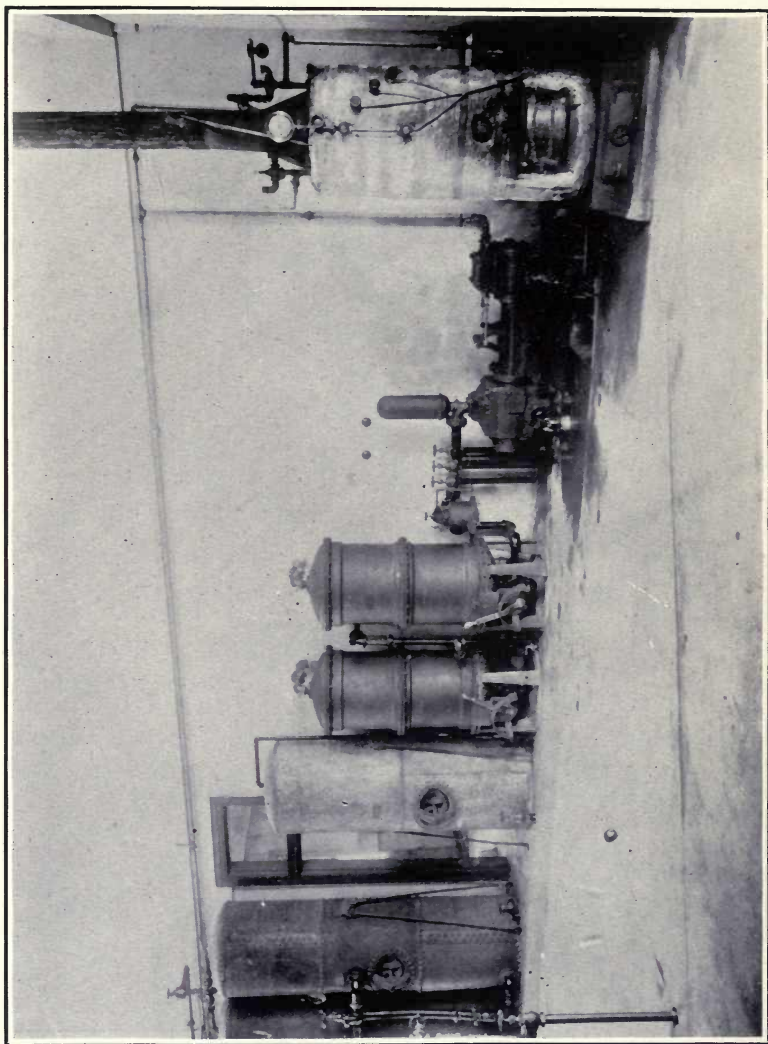


PLATE XI. CORNER OF BOILER ROOM SHOWING FIRE PUMP, FILTERS, ETC.

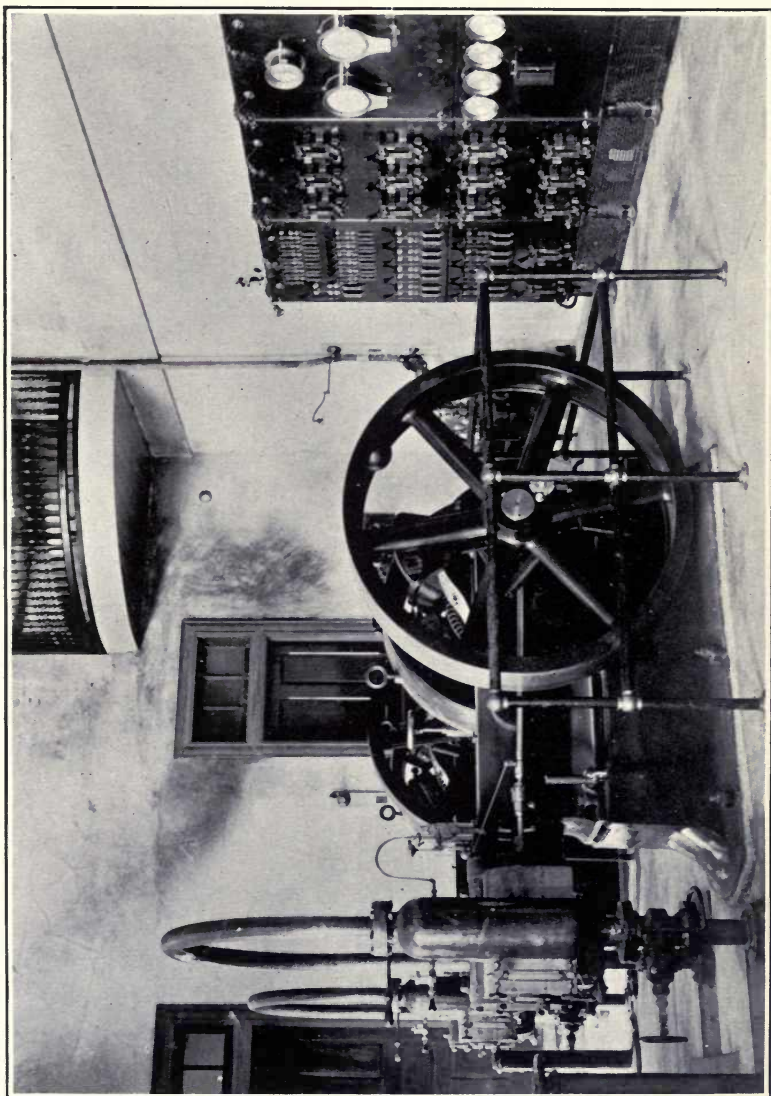


PLATE XII. CORNER OF THE ENGINE ROOM.



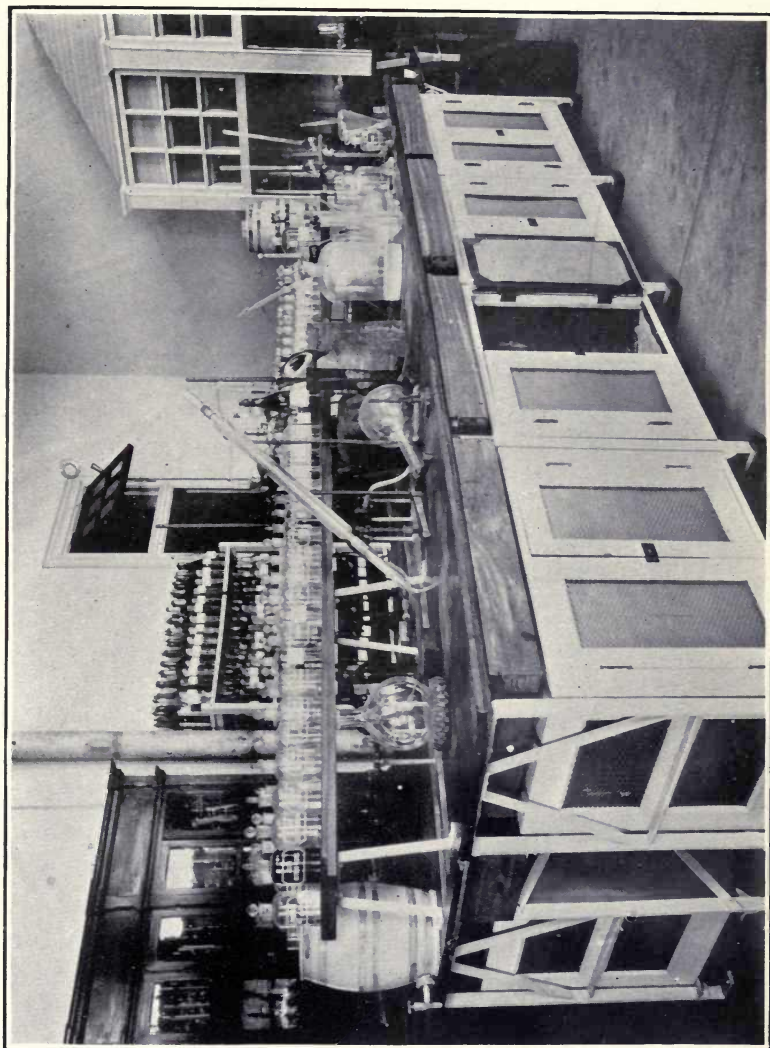


PLATE XIII. ROOM IN THE CHEMICAL LABORATORY SHOWING TYPE OF CENTRAL DESK.



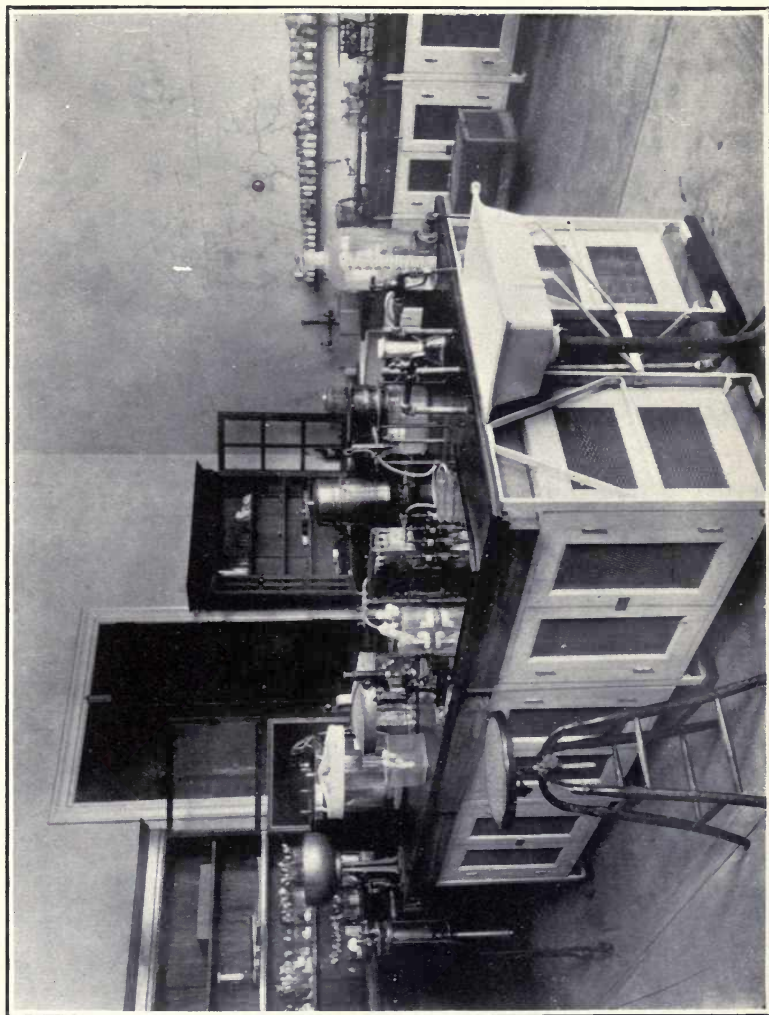


PLATE XIV. ROOM IN THE BIOLOGICAL LABORATORY SHOWING TYPE OF CENTRAL DESK.



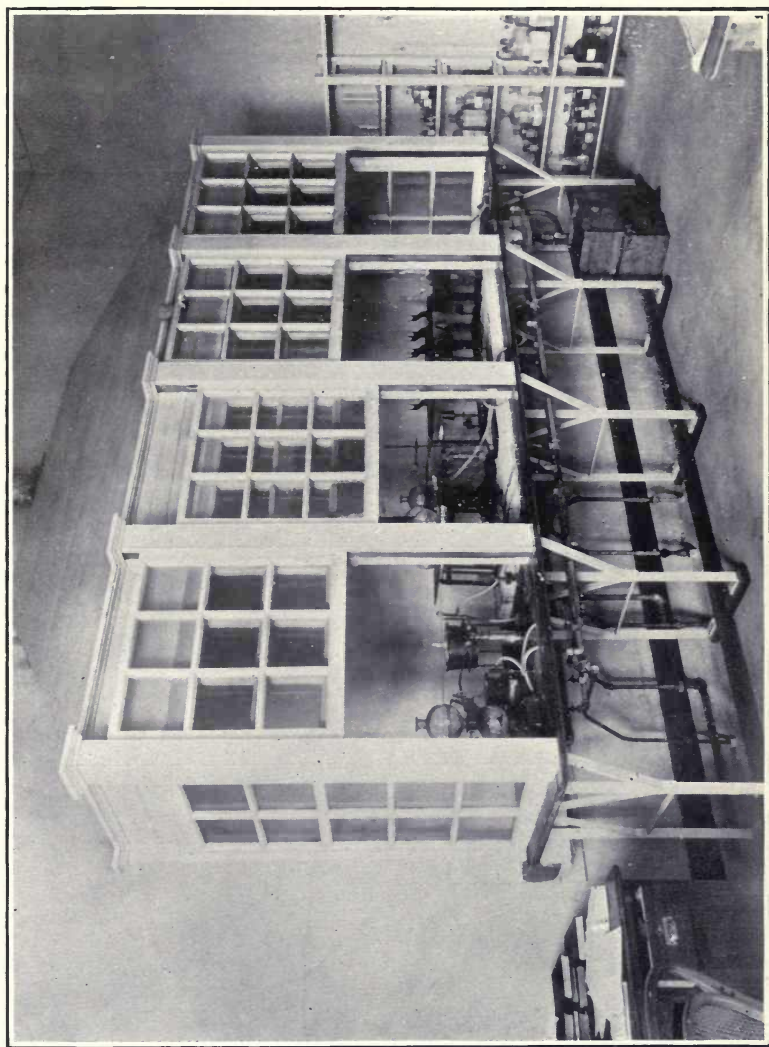


PLATE XV. ONE OF THE LARGER HOODS IN THE CHEMICAL LABORATORY.



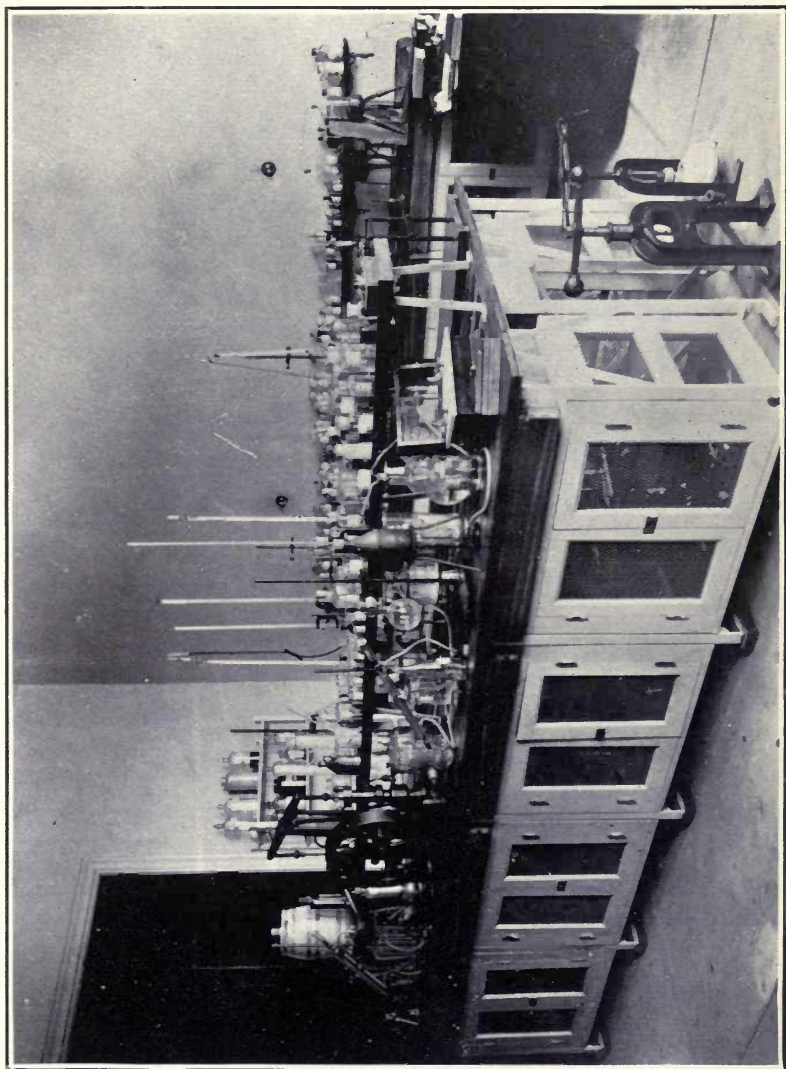


PLATE XVI. TYPE OF ROOM IN CHEMICAL LABORATORY.



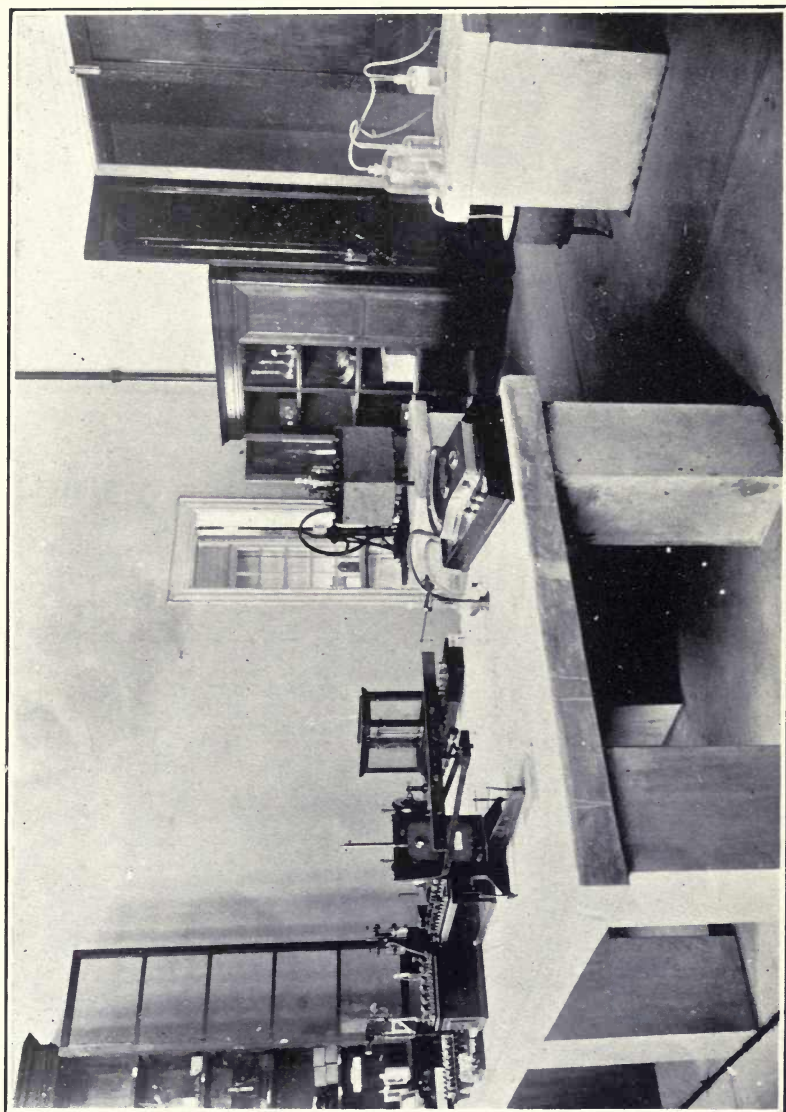


PLATE XVII. MAIN ROOM DEVOTED TO PHYSICS AND PHYSICAL CHEMISTRY.



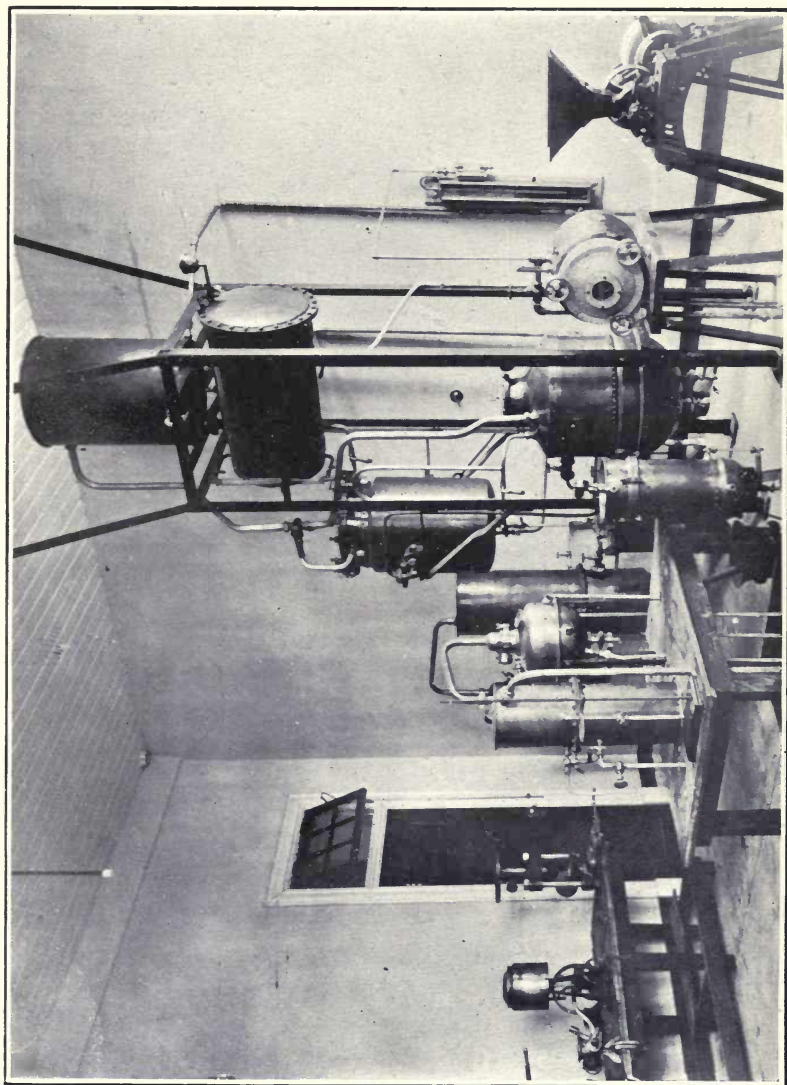


PLATE XVIII. VACUUM DRYING AND DISTILLING APPARATUS, ETC.



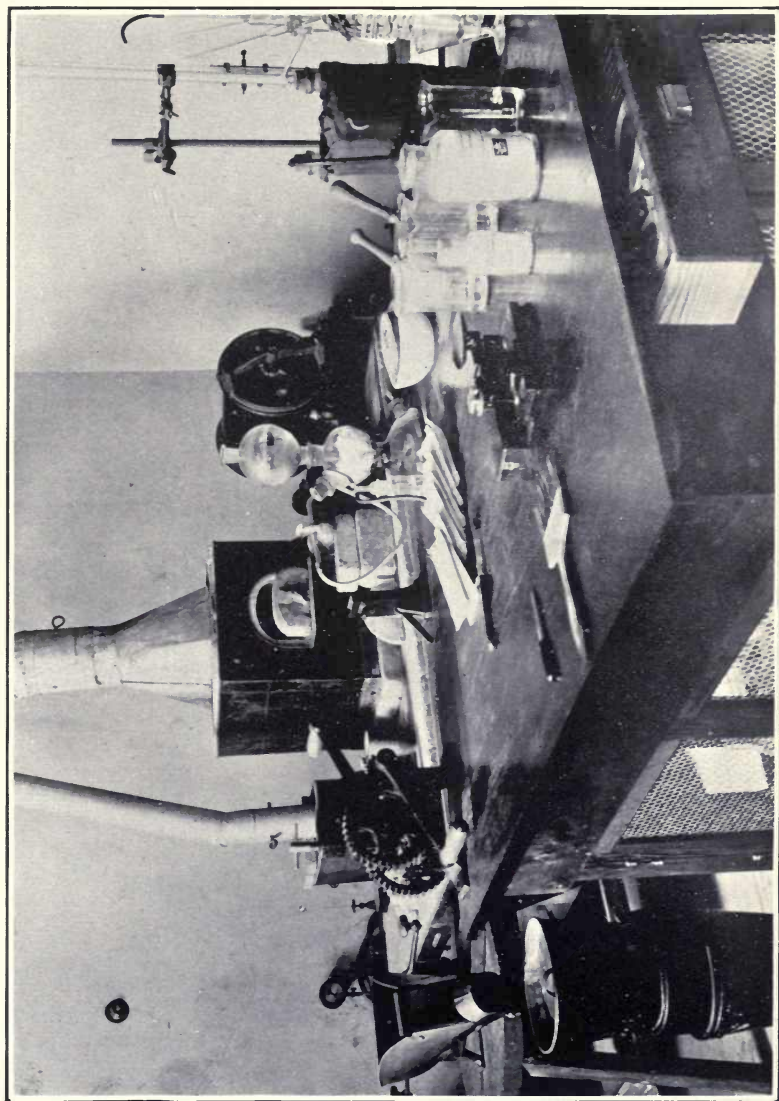


PLATE XIX. ASSAY ROOM.



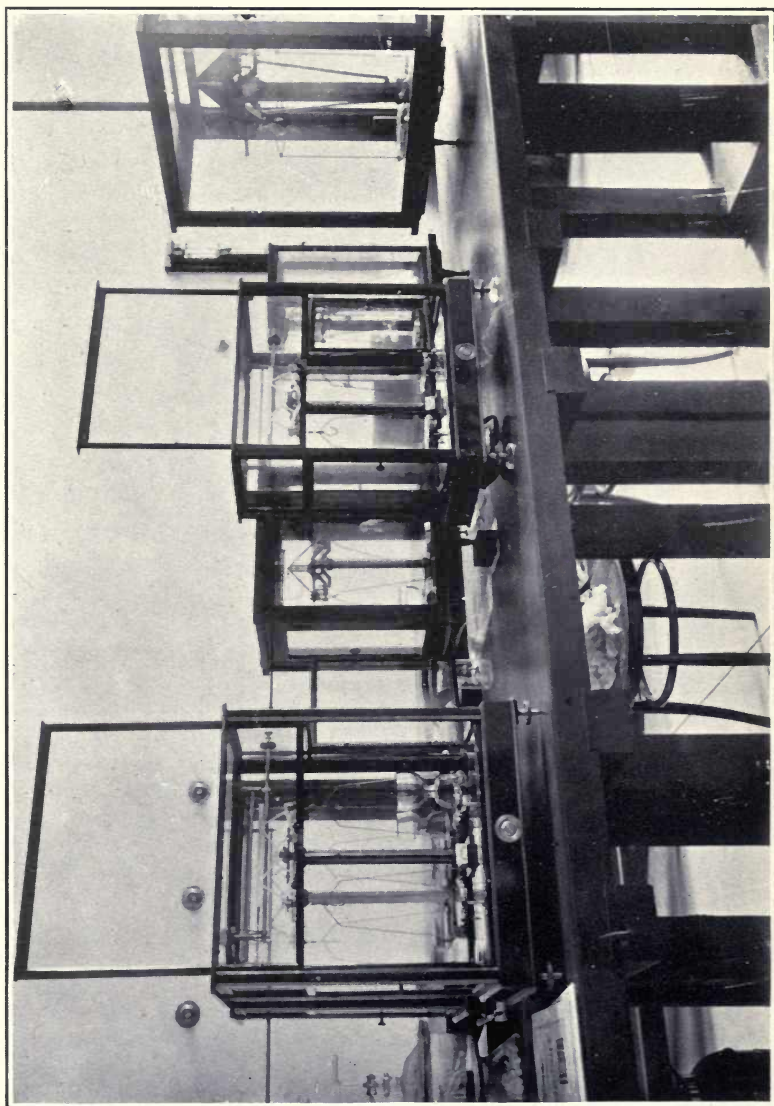


PLATE XX. ONE OF THE BALANCE ROOMS.



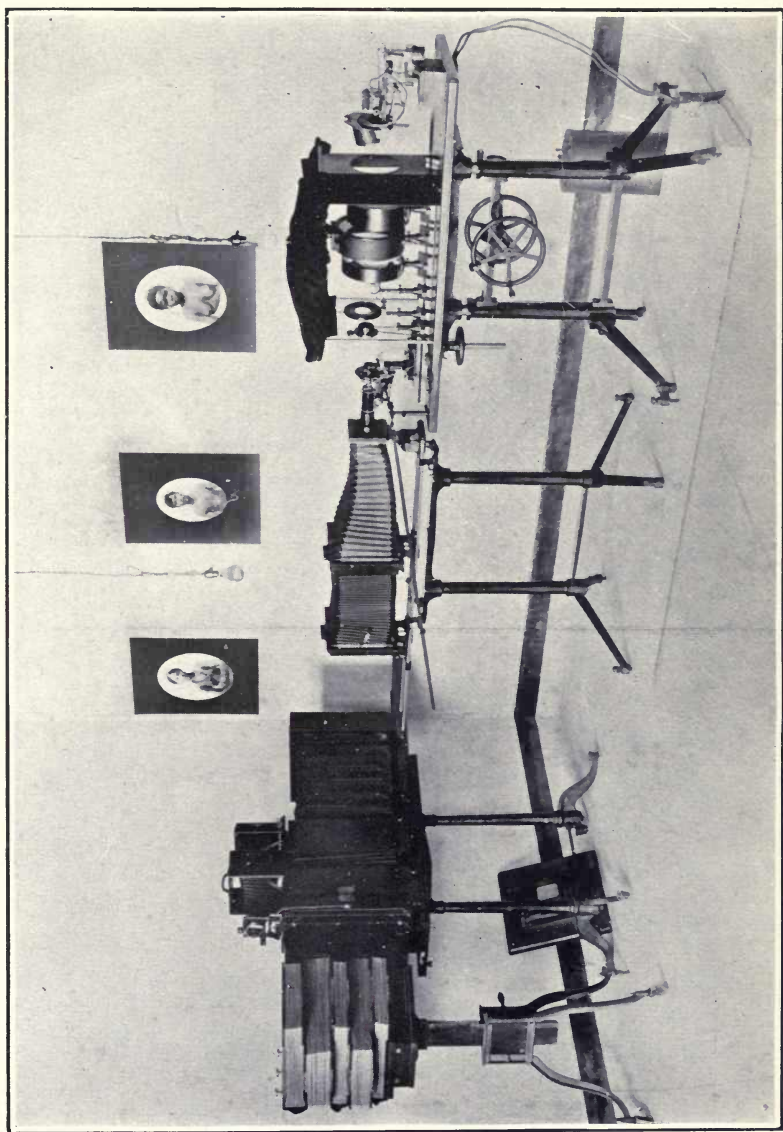


PLATE XXI. CORNER OF PHOTOGRAPHER'S STUDIO.





PLATE XXII. LIBRARY (CENTRAL ROOM).



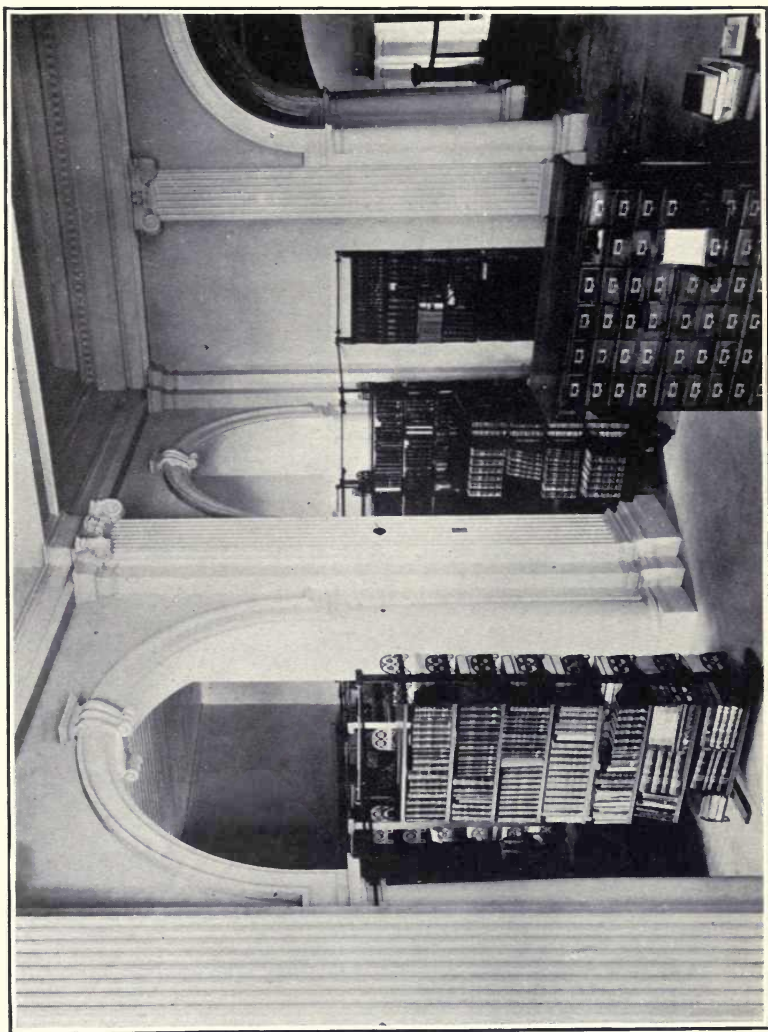


PLATE XXIII. LIBRARY (WEST ALCOVE).



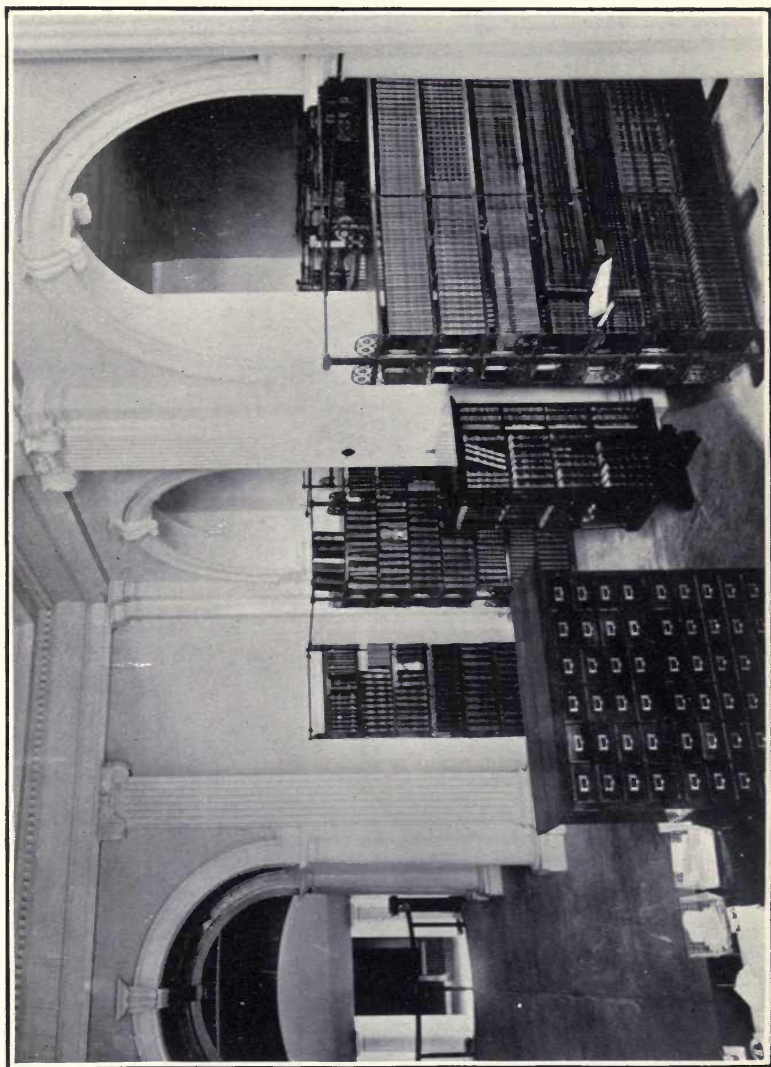


PLATE XXIV. LIBRARY (EAST ALCOVE).





PLATE XXV. SHOWING METAL STACK IN LIBRARY.



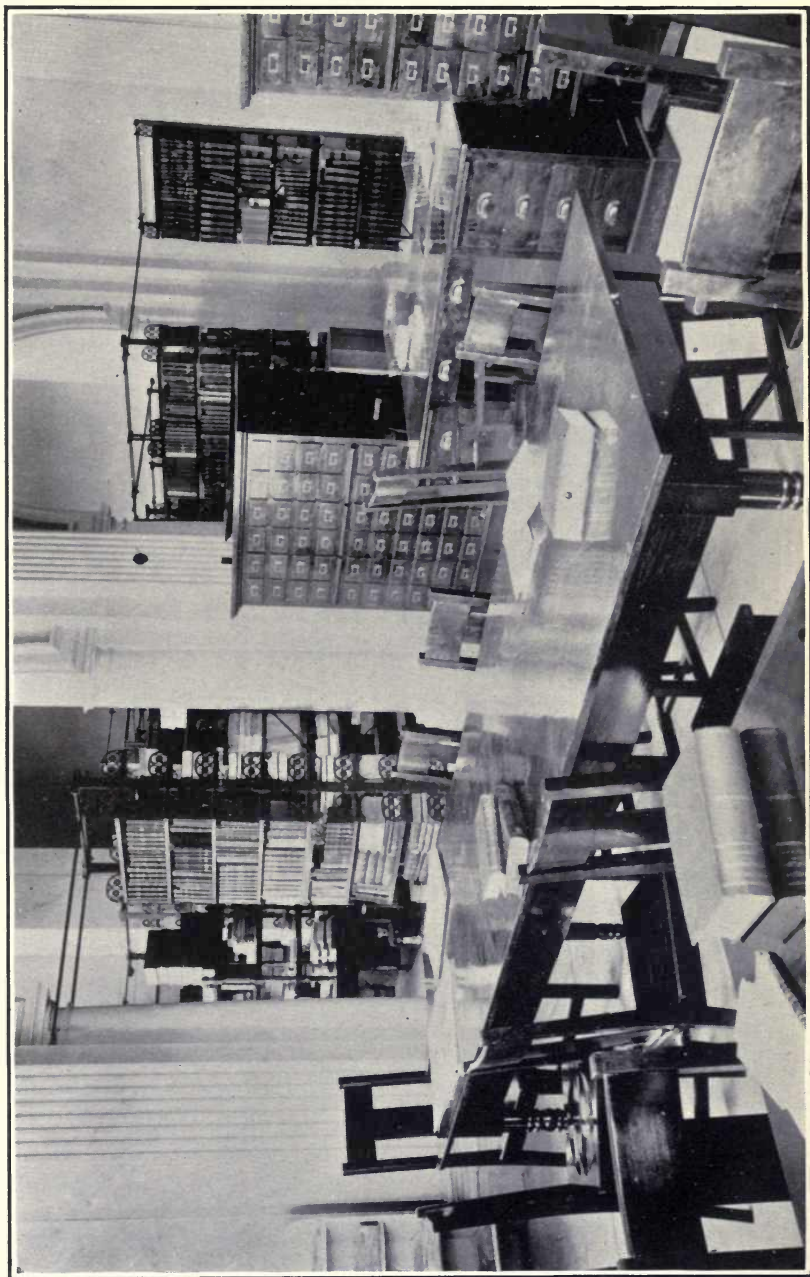


PLATE XXVI. LIBRARY, SHOWING ONE OF READING TABLES.



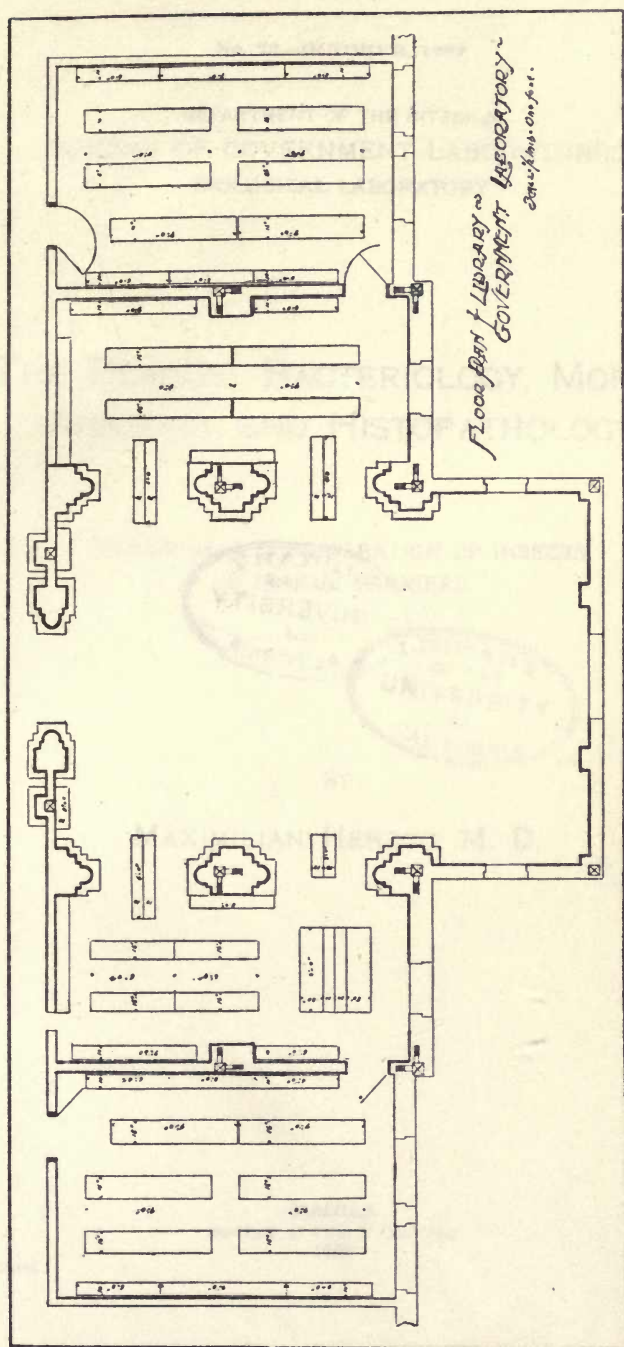
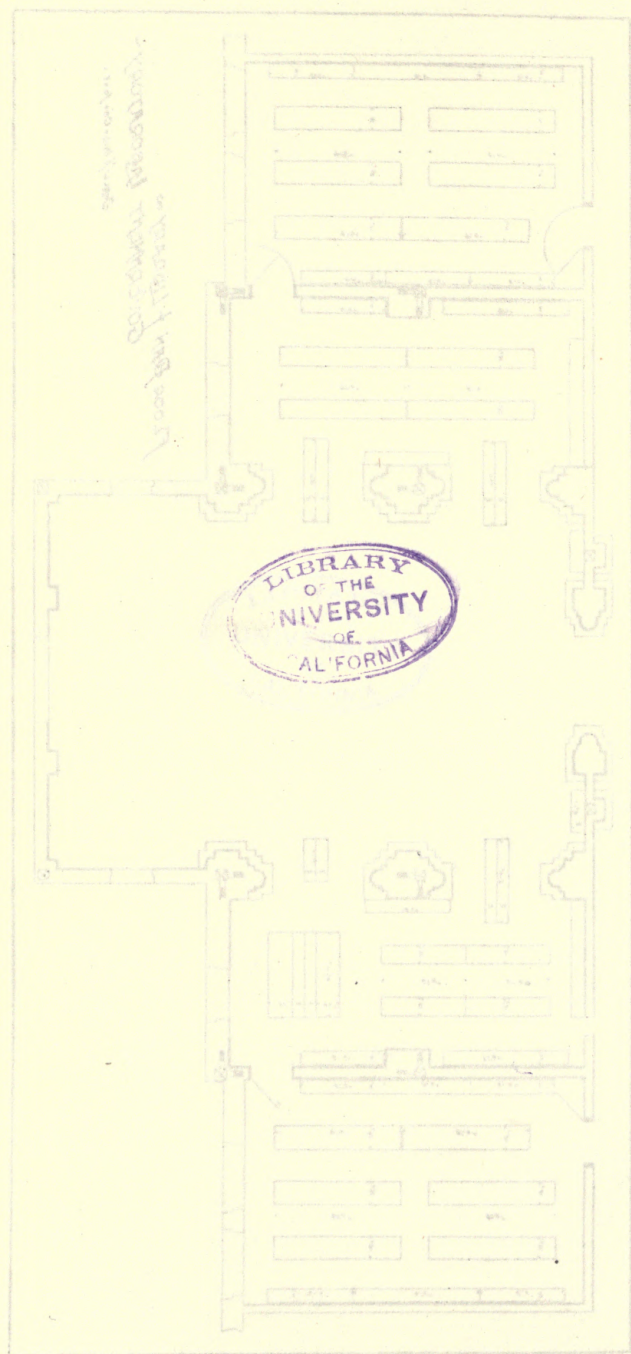
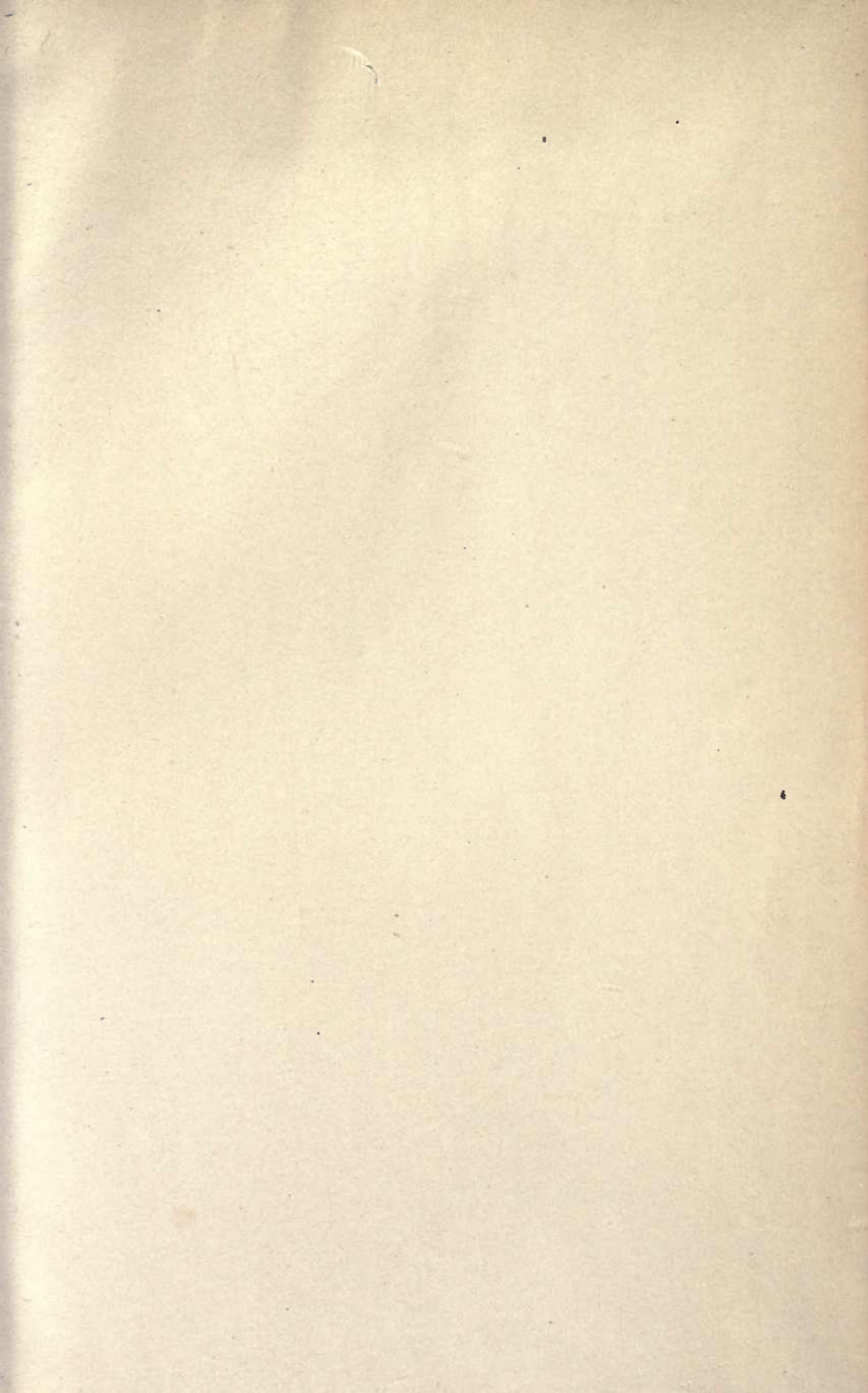


PLATE XXVII. FLOOR PLAN OF LIBRARY ROOMS.

PLATE XXIII. FLOOR PLAN OF LIBRARY BUILDING.





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